

**FACT SHEET FOR NPDES PERMIT WA-000295-0**  
**FACILITY NAME INTALCO ALUMINUM CORPORATION**

**SUMMARY**

DRAFT

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## INTRODUCTION

The Federal Clean Water Act (FCWA, 1972, and later modifications, 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System of permits (NPDES permits), which is administered by the Environmental Protection Agency (EPA). The EPA has authorized the State of Washington to administer the NPDES permit program. Chapter 90.48 RCW defines the Department of Ecology's authority and obligations in administering the wastewater discharge permit program.

The regulations adopted by the State include procedures for issuing permits (Chapter 173-220 WAC), water quality criteria for surface and ground waters (Chapters 173-201A and 200 WAC), and sediment management standards (Chapter 173-204 WAC). These regulations require that a permit be issued before discharge of wastewater to waters of the state is allowed. The regulations also establish the basis for effluent limitations and other requirements which are to be included in the permit. One of the requirements (WAC 173-220-060) for issuing a permit under the NPDES permit program is the preparation of a draft permit and an accompanying fact sheet. Public notice of the availability of the draft permit is required at least thirty days before the permit is issued (WAC 173-220-050). The fact sheet and draft permit are available for review (see [Appendix A--Public Involvement](#) of the fact sheet for more detail on the Public Notice procedures). Appendices B and C include a glossary of the terms used in this fact sheet and a reference to access the spreadsheet tools commonly used by the Department.

The fact sheet and draft permit have been reviewed by the Permittee. Errors and omissions identified in this review have been corrected before going to public notice. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. The fact sheet will not be revised. Comments and the resultant changes to the permit will be summarized in Appendix D--Response to Comments.

<b>GENERAL INFORMATION</b>	
Applicant	Intalco Aluminum Corporation
Facility Name and Address	Intalco Aluminum Corporation 4050 Mountain View Road P.O. Box 937 Ferndale, Washington 98248
Type of Facility:	Primary Aluminum Smelting
SIC Code	3334
Discharge Locations	Strait of Georgia
Outfall 001	Latitude: 48° 50' 26.8" N      Longitude: 122° 43' 13.6" W
Outfall 002	Latitude: 48° 50' 22" N      Longitude: 122° 42' 56.1" W
Outfall 003	Latitude: 48° 50' 49" N      Longitude: 122° 42' 56.1" W
Outfall 004	Latitude: 48° 50' 13" N      Longitude: 122° 42' 52" W
Outfall 005	Latitude: 48° 50' 31" N      Longitude: 122° 42' 49" W
Outfall 011	Latitude: 48° 50' 33" N      Longitude: 122° 42' 53" W
Outfall 012	Latitude: 48° 50' 25" N      Longitude: 122° 42' 53" W
Water Body ID Number	WA-01-0030

## BACKGROUND INFORMATION

### *DESCRIPTION OF THE FACILITY*

#### HISTORY

The Intalco Aluminum Corporation (Intalco) began the operations of a primary aluminum smelter near Ferndale, Washington in 1966. At full production the facility employs approximately 800 people. The smelter is currently operating at approximately 40% capacity with a workforce of 400 people.

#### INDUSTRIAL PROCESS

The Ferndale facility produces primary aluminum metal by the Hall-Heroult reduction process. The facility operates three pot lines, which contain a total of 720 side worked, pre-bake anode reduction cells. The smelter, in the past, has been capable of producing approximately 307,000 tons of aluminum metal per year at full production. All metal produced is cast on-site into various sizes and forms: sows, tees, slabs, billets, and ingots.

#### DISCHARGE LOCATIONS

The facility is located near Cherry Point along the Strait of Georgia. The process wastewater outfall line (001) is suspended from the shipping pier and extends approximately 1100 feet from the edge of the shoreline. The stormwater outfall line (002) is approximately 800 feet south of the process outfall line and extends approximately 250 feet from the shoreline in a westerly direction. The approximate locations of Outfalls 001, 002, 003, 004, 005, 011, and 012 are as follows. The locations of these discharges are also shown on the map in **Appendix E**.

Outfall	Latitude	Longitude
001	48° 50' 26.8" N	122° 43' 13.6" W
002	48° 50' 22" N	122° 42' 56.1" W
003	48° 50' 49" N	122° 42' 56.1" W
004	48° 50' 13" N	122° 42' 52" W
005	48° 50' 31" N	122° 42' 49" W
011	48° 50' 33" N	122° 42' 53" W
012	48° 50' 25" N	122° 42' 53" W

## DISCHARGE DESCRIPTIONS

Intalco maintains a total of seven outfalls (001, 002, 003, 004, 005, 011, and 012). The discharge from each of the outfalls is described below.

### Outfall 001:

Non-contact cooling water from Intalco's air compressors is the largest component of the discharge at Outfall 001. Treated wastewaters from Intalco's primary and secondary wastewater treatment systems, sanitary lagoon, anode contact cooling water from the carbon plant, and water heater/steam cleaner systems are commingled with the non-contact cooling water before discharge at Outfall 001. Major pollutants include total suspended solids (TSS), fluoride, and aluminum. Other possible pollutants include cyanide, benzo(a)pyrene, and oil and grease.

The effluent to Outfall 001 is conveyed through a 24-inch diameter fiberglass reinforced plastic pipe and discharged through a 24-inch diameter, 120-foot long diffuser. The discharge is continuous and in the past has averaged 3.0 million gallons per day (MGD), with a maximum of 5.0 MGD. The Permittee is supplied with treated (coagulated) water from the Nooksack River by the Whatcom Public Utility District #1 (PUD). The plant's air compressors are water-cooled by the PUD water. That cooling water constitutes approximately 80-90% of the volume of discharge at Outfall 001.

Intalco's Primary Wastewater Treatment System (PWTS) treats wastewater from the potline's air pollution control system (wet scrubbers). The PWTS consists of two clarifiers (the older clarifier is only used when the other clarifier is shut down for maintenance). The clarifier provides treatment in the form of precipitation and sedimentation to remove solids and to reduce the turbidity in the wet scrubber wastewater. Cooling water from the cast house is used as makeup water in the PWTS. A small stream of blowdown from the boiler used to heat the caustic storage tank (part of the Secondary Wastewater Treatment System described below) is also treated in the PWTS. Most of the treated effluent from the clarifier is recycled back into the wet scrubbers. The remainder of the effluent is routed to the Secondary Wastewater Treatment System (SWTS) for removal of dissolved fluoride.

The SWTP is comprised of an equalization tank (ET) and two treatment trains running in parallel. Each treatment train consists of a reaction tank and a flocculation tank. Additional tanks supporting the treatment process are those used for storage of the treatment chemicals (calcium chloride, sulfuric acid, and coagulant). Wastewater routed from the PWTS to the SWTS for fluoride treatment is pumped into the ET where it is combined with leachate from the on-site landfill leachate collection system. Pollutants in the PWTS effluent include high concentrations of particulate and fluoride. The landfill leachate contains high concentrations of fluoride and occasional high concentrations of cyanide. Wastewater in the equalization tank is pumped to the treatment train in the SWTS. Chemical treatment is followed by further treatment of the effluent in the form of sedimentation of solids in the clarifier. Some of the solids that settle out in the clarifier are recycled back into the clarifier and the remainder of the solids (sludge) are dewatered in a rotary vacuum drum filter. The dewatered sludge is disposed of in the Permittee's on-site RCRA landfill.



Intalco's domestic wastewater is discharged to the plant's aerated sanitary lagoon. Effluent from the lagoon is treated by ultraviolet (UV) disinfection before being discharged into a pipeline to Outfall 001. Total discharge volume is continuous and in the past has averaged 0.035 MGD. The flow rate is expected to go down with the reduction in workforce to less than 400 employees. The permit allows for a reduction in removal efficiency when the average number of employees in a month is below 400. The permitted pollutants in the discharge are biochemical oxygen demand (BOD), total suspended solids (TSS), and fecal coliforms.

Anode contact cooling water is generated during the anode production process. Intalco's anodes are made from petroleum coke and coal tar pitch. The coke and pitch are mixed together and then shaped into an anode with a mechanical press under high temperature and pressure. To facilitate maintaining the shape of the anode, the anodes are cooled with a strong spray of cold water after removal from the press. During the spraying process, the contact water is contaminated with coke and pitch containing Polycyclic Aromatic Hydrocarbons (PAHs) [including benzo(a)pyrene (B(a)P)]. This wastewater is filtered through a screen (to remove solids with adsorbed PAHs). The filtered wastewater is then discharged to the process sewer system without any additional treatment before it is discharged at Outfall 001. The proposed permit requires the Permittee to conduct a treatment efficiency study of the anode contact cooling water filtration system to determine if it meets AKART standards. The treatment efficiency study is discussed in more detail later on in this document.

Intalco operates a steam-cleaning station in each of three maintenance shops (Automotive, Central, and Annex). These stations are used to clean various pieces of plant equipment prior to maintenance activities. The wastewater from these stations is treated with sand filtration to remove suspended solids and with a coalescing filter to remove oil and grease. The filtered wastewater is then discharged to the process sewer system without any additional treatment before it is discharged at Outfall 001.

#### Outfall 002:

Due to the nature of the aluminum smelting process, there is potential for stormwater to contact raw materials, byproduct or waste materials that could contaminate the stormwater. To mitigate the discharge of any suspended solid material, all stormwater collected from the industrial portion of the plant site is routed through a stormwater settling lagoon in the southwest corner of the plant. The stormwater lagoon provides approximately 1.7 million gallons of capacity. The pond (built in 1992) is a flow-through system designed to allow solids to settle from the stormwater. The stormwater pond is designed to treat maximum stormwater flow rates up to 30 cubic feet per second (cfs). The pond was conservatively sized (1.9 million gallons) based on the 6-month, 24-hour design storm volume of 1.5 million gallons. The hydraulic capacity of the stormwater system (including diversion structures) was designed for a 100-year, 24-hour (4.0 inches of rain) storm. All flow in excess of 28 cfs is diverted around the pond via a series of three overflow structures.

Stormwater from outside the industrially developed plant site flows through two separate ditches. The two separate ditches combine with the stormwater pond effluent at the Outfall 002 monitoring and compliance point (D-10). At this point, the water is further treated to remove oil and other floating materials with a continuously operated mechanical oil skimmer. Absorbent

materials (e.g. socks) are located immediately prior to the location where the effluent enters the discharge pipe.

The discharge to Outfall 002 is conveyed through a 30-inch diameter fiberglass reinforced plastic pipe and has no diffuser. This discharge, in the past, has been continuous and has averaged 0.6 MGD, with a typical range of 0.1 to 2.4 MGD for a monthly average. During storm events the flow may reach levels as high as 12.5 MGD. The primary sources of water for this discharge include stormwater runoff from the 320 acres in-plant area and also the off-plant area of Intalco. Major pollutants discharged from Outfall 002 include total suspended solids, fluoride, and aluminum.

Periods of zero discharge occur at Outfall 002 during dry summer weather.

#### Outfalls 003, 004, and 005:

Outfall 003 discharges stormwater runoff and leachate from industrial solid waste in a historic landfill known as the Beach I Landfill. This landfill was operated from 1966 to 1978 by Intalco and is located northwest of the main plant site along a bluff overlooking the Strait of Georgia.

Outfall 004 discharges stormwater runoff and leachate from industrial solid waste in a historic landfill known as Beach II Landfill. This landfill was operated from 1971 to 1984 by Intalco and is located southwest of the main plant site along a bluff overlooking the Strait of Georgia.

Outfall 005 discharges stormwater runoff and leachate from industrial solid waste in a historic landfill known as the Construction Debris Landfill. This landfill was operated from 1966 to 1973 by Intalco and is located due west of the main plant site along a bluff overlooking the Strait of Georgia.

The control and elimination of these discharges is discussed in more detail in the Landfill Monitoring section later on in this document.

#### Outfalls 011 and 012:

The silo storage area at the entrance to the pier contains three 100-foot diameter alumina storage silos. The drainage area of the alumina silo storage area is about 550 feet by 200 feet (2.5 acres) and is divided into two watersheds.

The northern portion of the silo storage area drains to a single catch basin and discharges to Outfall 011. This outfall is embedded deep in the riprap shoreline along the northern edge of the silo storage area. Drainage from the stormwater collection ditch on the north side of the road enters a catch basin at the southeast corner of the truck escape ramp and is also discharged at Outfall 011. Additional drainage from the terraces on the hillside east of the road is conveyed through a series of catch basins and drains to the same catch basin at southeast corner of the truck escape ramp and is discharged at Outfall 011. Major pollutants include TSS, fluoride, and aluminum. Intalco is required to reduce the TSS concentration in the discharge at Outfall 011 by implementing the BMPs in Condition S.16 of the proposed permit.

The middle and southern portion of the silo storage area drain to three catch basins arranged in a north-south alignment and connected in series in a single pipe. These three southern most catch basins discharge to Outfall 012. This outfall is embedded deep in the riprap shoreline along the southern edge of the silo storage area. Outfall 012 is located in an area that is difficult to access due to vegetation and is only accessible on foot. Major pollutants include total suspended solids (TSS), fecal coliform, fluoride, and aluminum. The results of an analysis of the Outfall 012 discharge showed that the TSS concentration and fecal coliform were higher than EPA stormwater benchmarks. On May 12, 2004 Ecology inspected Outfall 012 and noticed that there were a lot of animal wastes in the vicinity of these outfalls. Therefore, Ecology believed that the animal wastes contributed to the high fecal coliform levels. Intalco is required to reduce the TSS concentration in the discharge at Outfall 012 by implementing the BMPs in Condition S.16 of the proposed permit.

The Permittee will be required to collect monthly grab samples from the catch basin sumps for Outfalls 011 and 012 when flow is available. The samples will be analyzed for TSS, BOD, aluminum, fluoride, and fecal coliform. After one year of testing at Outfalls 011 and 012, the Permittee will have the option to petition the Department in writing to reduce or eliminate this monitoring.

#### **DIVERTING WATER TO THE BP COGENERATION FACILITY**

Whatcom County Public Utility District No. 1 (PUD) owns the water rights for water in the Ferndale area and Intalco and the BP Cherry Point refinery contract for water through the PUD. The PUD withdraws water from the Nooksack River. Intalco has recently completed an agreement with the PUD and BP for a water reuse project. Under the agreement, Intalco will provide the water needed to operate the proposed BP cogeneration facility. Intalco will divert up to 4.5 MGD of non-contact, once-through cooling water normally discharged through Outfall 001, to the cogeneration facility for use in their evaporative cooling system.

Implementation of this system is expected to occur in late 2006, or about six months prior to the start-up of the cogeneration facility. This project will allow for the reuse of industrial wastewater rather than consuming new water resources from the Nooksack River.

#### **PERMIT STATUS**

The previous permit for this facility was issued on September 1, 1998 and modified on June 1, 2000 and January 4, 2002. The effluent limitations for Outfall 001, Outfall 002, and the Sanitary Lagoon were as shown in the following tables:

<b>Effluent Limitations: Outfall # 001</b>			
<b>Parameter</b>	<b>Units</b>	<b>Monthly Average</b>	<b>Daily Maximum</b>

Effluent Limitations: Outfall # 001			
Parameter	Units	Monthly Average	Daily Maximum
Total Suspended Solids	lbs/day	150	185
	mg/l	10	--
Fluoride	lbs/day	68	296
Aluminum	lbs/day	10.3	30
Free Cyanide	mg/l	<0.012	0.012
Benzo(a)Pyrene	mg/l	<0.01	0.01
Oil and Grease	mg/l	5	10
pH		Within the range of 6.0 - 9.0	

Effluent Limitations: Outfall # 002			
Parameter	Units	Monthly Average	Daily Maximum
Total Suspended Solids	mg/l	35	75
Fluoride	mg/l	35	50
Aluminum	mg/l	10	15
Benzo(a)Pyrene	mg/l	--	<0.01
Oil and Grease	mg/l	5	10
pH		Within the range of 6.0 - 9.0	

Effluent Limitations: Sanitary Lagoon Discharge			
Parameter	Units	30-Day Average	7-Day Average
Biochemical Oxygen Demand	mg/l	45.0	65.0
	lbs/day	22.4	32.4
Total Suspended Solids	mg/l	45.0	65.0
	lbs/day	22.4	32.4

<b>Effluent Limitations: Sanitary Lagoon Discharge</b>			
<b>Parameter</b>	<b>Units</b>	<b>30-Day Average</b>	<b>7-Day Average</b>
Fecal Coliform	Colonies/100 ml	200	400
Chlorine	mg/l	Minimum - 0.1	Maximum - 1.5
pH		Within the range of 6.0 - 9.0	

An application for permit renewal was submitted to the Department on March 5, 2003 and accepted by the Department on June 24, 2003. Additional 2F forms for Outfalls 003, 004, and 005 were submitted to Ecology and accepted by the Department.

### ***SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT***

The facility last received an unannounced Class II inspection on May 5-6, 2004. The facility was found to be in compliance with the permit limits at the time of the inspection. The last non-sampling inspection was completed on November 17, 2003.

In general, the Permittee has remained in compliance with effluent limits and other permit requirements during the previous permit term, based on monthly Discharge Monitoring Reports (DMRs) and inspections conducted by the Department. Appendix F summarizes the incidents of noncompliance.

The previous permit required a number of special studies to be completed during the term of the permit. Studies of the effluent included annual priority pollutant testing, acute and chronic toxicity testing, a stormwater characterization study, and stormwater sampling. Other studies or requirements included an outfall evaluation, preparation of stormwater pollution prevention plans, a sediment study, an engineering study for chlorination, preparation of a stormwater pond operational plan and engineering report, development of a potline ditch cleaning schedule, an aluminum and fluoride source study, and a potroom roof run-off study. All of the studies were completed as required by the NPDES permit and are discussed in the next section and later in this document.

### ***REVIEW OF PREVIOUS PERMIT REQUIREMENTS***

#### **1. Primary Wastewater Treatment System Operational Plan:**

Intalco is required to operate process wastewater treatment systems according to procedures and criteria described in an operating plan. Condition S.7 of the previous permit requires Intalco to update and maintain operational plans on site for the process wastewater treatment systems. Intalco has not updated the operational plan for the primary treatment system. Condition S11. of the proposed permit requires Intalco to

conduct an efficiency study of the PWTS, upgrade the system if it does not meet design treatment standards, and to develop an operational plan for the PWTS.

2. Secondary Wastewater Treatment System Operational Plan:

Intalco submitted a copy of the updated operational plan for the secondary treatment system in March 2004. The operational plan for the SWTS fulfills the requirements of the previous permit.

3. Sanitary Wastewater Treatment System Operational Plan:

Intalco submitted a copy of the "Sanitary Water Treatment Facility Operations and Maintenance Manual" in March 2004. This manual fulfills the requirements of previous permit.

4. Stormwater Pond Operational Plan:

Condition S7. of the previous permit required Intalco to develop and maintain a Stormwater Pond Operational Plan. In order to meet the requirements for the operational plan, Intalco conducted site hydrologic and rainfall characterizations and developed a stormwater model. Intalco was also required to submit an as-built engineering report which included design criteria for TSS removal efficiencies at the stormwater pond. Intalco submitted the operating plan and the as-built engineering report as sections of the Stormwater Runoff Study Final Report in July 2001. Ecology reviewed the Stormwater Runoff Study Final Report and determined that Intalco fulfilled the requirements of the previous permit. Intalco made recommendations regarding the maintenance of the stormwater pond in the final report that have been included as requirements in Condition S16 of the proposed permit.

5. Stormwater Pollution Prevention Plan:

Condition S.9. of the previous permit required Intalco to submit a Stormwater Pollution Prevention Plan (SWPPP). Intalco was required to implement the operational and source control BMPs outlined in the SWPPP, submit a schedule for cleaning alumina and other debris from the potline ditches, and conduct a study to determine the contributions of aluminum and fluoride to the stormwater system from runoff from the roofs of the potroom buildings.

Intalco submitted the SWPPP on August 27, 1999, additional information for the SWPPP in January 2000, the schedule for cleaning the potline ditches in January of 2000, and the final potroom roof runoff study results in July of 2001. Intalco leased a new more effective sweeper and began implementing the potline ditch cleaning schedule in September 2000. Based on a review of these documents, Ecology determined that Intalco has fulfilled the requirements of the previous permit. Intalco recommended BMPs and other action items in the SWPPP and also in the Stormwater Runoff Study Final Report.

Condition S17. of the proposed permit requires Intalco to implement the BMPs and other action items and to update the SWPPP.

6. Stormwater Characterization Study:

Condition S11. of the previous permit required Intalco to submit a stormwater sampling and analysis plan to Ecology for review and approval within the first year of the permit. The purpose of the Plan was to characterize the stormwater pond performance to determine the stormwater pond's pollutant contribution to Outfall 002 versus off-site contributions. Intalco submitted a final plan in March 2000. Intalco conducted the stormwater characterization study from April 2000 through March 2001. The results of the study are compiled in a document entitled "Stormwater Runoff Study Final Report". Ecology reviewed the results of the study and determined that the submittals met the requirements of the previous permit. The final report included BMPs that Intalco recommended. Ecology requires Intalco to implement and follow these BMPs in Condition S.17 of the proposed permit.

## ***WASTEWATER CHARACTERIZATION***

The proposed wastewater discharges were characterized by Intalco in the permit application process for conventional pollutants, metals, cyanide, volatile organic compounds, acid compounds, base neutral compounds, and pesticides. Long term average values reported below for Outfalls 001 and 002 and the sanitary lagoon effluent are based on extensive (daily to weekly) monitoring completed during the term of the permit. The table below also includes long term averages for pollutants with significant concentrations and/or of interest; the metals and organics listed include all of those that were quantified at greater than detection limits. These long term averages were calculated from six years of annual priority pollutant testing (1999-2004). Additional information is included in Appendices G and H.

Table 1: Wastewater Characterization (Long Term Average Value)		
Parameter	Concentration	Mass
<b>OUTFALL 001</b>		
TSS	4.20 mg/L	106 lbs/day
Fluoride	0.883 mg/L	23.4 lbs/day
Aluminum	0.57 mg/L	15.82 lbs/day
Free Cyanide	<0.005 mg/L	0.0025 lbs/day
B(a)P	<0.0001 mg/L	0 lbs/day
Oil & Grease	0.40 mg/L	10.4 lbs/day
Temperature	13.12°C	
pH	6.3-8.3	
Ammonia	0.105 mg/L	
Chlorine	0.025 mg/L	
Nitrate-Nitrite	0.644 mg/L	
Nickel	0.008 mg/L	
Zinc	0.012 mg/L	
Phenols	0.068 mg/L	
Total Organic Carbon	1.9 mg/L	
<b>OUTFALL 002</b>		
TSS	7.72 mg/L	52.6 lbs/day
Fluoride	16.1 mg/L	68.5 lbs/day
Aluminum	0.57 mg/L	17.96 lbs/day
Free Cyanide	<0.005 mg/L	--
B(a)P	<0.0001 mg/L	--
Oil & Grease	0.47 mg/L	2.41 lbs/day
Temperature	13.12°C	
pH	6.3-8.2	
Ammonia	0.077 mg/L	
Nitrate-Nitrite	0.088 mg/L	
Arsenic	0.0004 mg/L	
Chromium	0.0006 mg/L	



Table 1: Wastewater Characterization (Long Term Average Value)		
Parameter	Concentration	Mass
Nickel	0.015 mg/L	
Zinc	0.045 mg/L	
<b>SANITARY LAGOON EFFLUENT</b>		
BOD	13.35 mg/L	4.34 lbs/day
TSS	9.55 mg/L	3.08 lbs/day
Fecal Coliform	1.7 cfu/100mL	
pH	6.3-8.2	

### **SEPA COMPLIANCE**

This permit renewal has no SEPA compliance issues.

### **PROPOSED PERMIT LIMITATIONS**

Federal and State regulations require that effluent limitations set forth in a NPDES permit must be either technology- or water quality-based. Technology-based limitations are based upon the treatment methods available to treat specific pollutants. Technology-based limitations are set by regulation or developed on a case-by-case basis (40 CFR 125.3, and Chapter 173-220 WAC). Water quality-based limitations are based upon compliance with the Surface Water Quality Standards (Chapter 173-201A WAC), Ground Water Standards (Chapter 173-200 WAC), Sediment Quality Standards (Chapter 173-204 WAC) or the National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992). The more stringent of these two limits must be chosen for each of the parameters of concern. Each of these types of limits is described in more detail below.

The limits in this permit are based in part on information received in the application. The effluent constituents in the application were evaluated on a technology- and water quality-basis. The limits necessary to meet the rules and regulations of the State of Washington were determined and included in this permit. Ecology does not develop effluent limits for all pollutants that may be reported on the application as present in the effluent. Some pollutants are not treatable at the concentrations reported, are not controllable at the source, are not listed in regulation, and do not have a reasonable potential to cause a water quality violation. Effluent limits are not always developed for pollutants that may be in the discharge but not reported as present in the application. In those circumstances the permit does not authorize discharge of the non-reported pollutants. Effluent discharge conditions may change from the conditions reported in the permit application. If significant changes occur in any constituent, as described in 40 CFR 122.42(a), the Permittee is required to notify the Department of Ecology. The Permittee may be in violation of the permit until the permit is modified to reflect additional discharge of pollutants.

## ***DESIGN CRITERIA***

Intalco conducted a study to determine current capacities and treatment efficiencies of their wastewater treatment systems. Intalco submitted the results of that study to Ecology in a document titled “Primary Water Treatment Plant, Secondary Water Treatment Plant, and Sanitary Water Treatment Facility Capacities and Efficiencies” dated June 2004. These reports provide preliminary information. The permit will require treatment efficiency studies, when warranted, to determine the criteria necessary to monitor the efficiency of these systems.

## ***TECHNOLOGY-BASED EFFLUENT LIMITATIONS***

The Department reviewed the applicant's Form R (Toxic Release Inventory Reporting Form), list of Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III hazardous substances, and Form 2C of the NPDES Permit Application. The Department also reviewed the discharge monitoring reports (DMRs), study results, and wastewater inspection results generated during the term of the previous permit.

After reviewing this data, the Department has determined that, in general, the effluent limits from the previous permit will remain the same. These limits are believed to be effective regulatory controls.

The effluent limitations for toxic, non-conventional, and conventional pollutants at Outfalls 001 and 002 in the previous permit were established using Best Professional Judgment (BPJ). Although the applicant has discharges that are applicable subcategories in the federal effluent guidelines in 40 CFR Part 421 - Subpart B, these guidelines were not used to develop the limits. The limits for Outfall 001 are performance based and were developed by running a statistical analysis on two years of representative monitoring data using a method consistent with EPA and Ecology effluent limit setting guidelines.

The concentration limits for the sanitary lagoon are taken directly from the discharge standards and effluent limitations for domestic wastewater facilities, Chapter 173-221 WAC. On January 21, 2004, Intalco submitted a request for an alternative percent removal effluent limitation at the sanitary lagoon during periods of reduced operations or temporary curtailment. The Department reviewed the Permittee's request and determined that the Permittee meets the criteria required in Chapter 173-221-050 WAC and Chapter V, Section 3.5.1 of Permit Writer's Manual. Therefore, the removal efficiency for BOD and TSS in the sanitary lagoon discharge was reduced from a minimum of 65% to 55% when a monthly average of < 400 persons are employed onsite. The Permittee shall report the number of personnel onsite to the Department in the monthly discharge monitoring report. Upon an increase in personnel of  $\geq 400$  persons monthly average, the removal efficiency for BOD and TSS shall revert to a minimum of 65%.

Mass-based limits for B(a)P, antimony, and nickel were removed from the 1991 and 1998 NPDES permits for undefined reasons. Per 40 CFR 122.44(a)(1) and 122.44(1)(2)(ii), Ecology is reinstating these limits. Ecology used representative production rates and the federal effluent guidelines for the primary aluminum smelting subcategories in 40 CFR 421 to derive the respective production-based effluent limits summarized in the table below (see the footnote for a discussion of the derivation of the limits). Because the monitoring data from Outfall 002 is

highly auto correlated they do not meet the requirements for normal statistical distribution, a requirement for proper use of these guidelines. For this reason limits for Outfall 002 are based on Best Professional Judgement.

<b>B(a)P</b>	Production Rate million pounds (MMlb)	Effluent Limitation Guideline		Production-Based Effluent Limit	
		Maximum Day (lb/MMlb)	Maximum Monthly Average (lb/MMlb)	Daily Maximum	Maximum Monthly Average
Anode Contact Cooling and Briquette Quenching (40 CFR 421.23(b))	1.8	0.007	0.003	0.013	0.005
Potroom Wet Air Pollution Control (40 CFR 421.23(m))	2.1	0.056	0.026	0.118	0.055
Direct Chill Contact Cooling (40 CFR 421.23(q))	2.1	NA	NA	NA	NA
		<b>B(a)P Permit Limit (lb/day)</b>		<b>0.13</b>	<b>0.06</b>
<b>Antimony</b>	Production Rate million pounds (MMlb)	Effluent Limitation Guideline		Production-Based Effluent Limit	
		Maximum Day (lb/MMlb)	Maximum Monthly Average (lb/MMlb)	Daily Maximum	Maximum Monthly Average
Anode Contact Cooling and Briquette Quenching	1.8	0.403	0.18	0.725	0.324
Potroom Wet Air Pollution Control	2.1	3.204	1.428	6.728	2.999
Direct Chill Contact Cooling	2.1	2.565	1.143	5.387	2.400
		<b>Antimony Permit Limit (lb/day)</b>		<b>12.8</b>	<b>5.7</b>
<b>Nickel</b>	Production Rate million pounds (MMlb)	Effluent Limitation Guideline		Production-Based Effluent Limit	
		Maximum Day (lb/MMlb)	Maximum Monthly Average (lb/MMlb)	Daily Maximum	Maximum Monthly Average
Anode Contact Cooling and Briquette Quenching	1.8	0.115	0.077	0.207	0.139
Potroom Wet Air Pollution Control	2.1	0.913	0.614	1.917	1.289
Direct Chill Contact Cooling	2.1	0.731	0.492	1.535	1.033
		<b>Nickel Permit Limit (lb/day)</b>		<b>3.7</b>	<b>2.5</b>

Ecology used monthly average production data from 1999 and 2000 to determine the production rates used to derive the monthly average limits for each of the processes. The monthly average production rates were also used to derive the maximum daily limits because the Permittee had no daily production data available. Ecology used the respective actual maximum monthly average production rates (converted to a daily maximum production rate assuming 24 hours of operation for 30 days each month) to derive the daily maximum production-based limit.

The permittee's actual maximum monthly average production data for the Anode Contact Cooling and Briquette Quenching process was based on 16 hours of production per day. The Permittee plans to operate this process 24 hours a day during the next permit cycle. Ecology converted the maximum monthly average production rate into a maximum daily production rate based on 24 hour per day operation for a 30 day month per the calculations below. Ecology used the new

maximum daily production rate to derive the maximum daily limits for the Anode Contact Cooling and Briquette Quenching process.

Calculations:

maximum monthly average production rate = 17668 tons per month

$(17668 \text{ tons/month}) \times (\text{month}/30 \text{ days}) = 589 \text{ tons/day}$

$(589 \text{ tons/day}) \times (16 \text{ hours/day}) = 37 \text{ tons/hour}$

$(37 \text{ tons/hour}) \times (24 \text{ hours/day}) = 888 \text{ tons/24 hour day}$

$(888 \text{ tons/day}) \times (2000 \text{ lb/ton}) \times (\text{MM lb}/1.0 \times 10^6 \text{ lb}) = 1.8 \text{ MM lb/day} = \text{Maximum Daily Production}$

With the netting out allowance for TSS and aluminum at Outfall 001, the intake water (PUD) levels were often higher than effluent levels. This resulted in a large number of zeros in the data set. After evaluating several different ways to set limits for TSS and aluminum at Outfall 001 under the “netting out” provision, the permit writer decided to assign limits from the previous permit (issued February 14, 1992). The limits for daily maximum and monthly average TSS and daily maximum aluminum were determined by multiplying EPA Best Available Technology Economically Achievable (BAT) treatability levels by production normalized flows from process and non-process wastewater sources.

The effluent pH limitation in the proposed permit will continue to be 6.0 to 9.0. This limitation is based on Best Practicable Control Technology (BPT) from guidelines in 40 CFR Part 421.22. This range (6.0 to 9.0) will not result in water quality violations.

*NETTING OUT*

The industrial water supplied to Intalco by Whatcom County PUD No. 1 is treated Nooksack River water. The treatment process consists of coagulation/flocculation followed by gravity separation. The treated water is not filtered and contains concentrations of TSS and aluminum. About 80-90% of Intalco's process water discharge is non-contact cooling water. The concentration of these two constituents in the PUD supply water is neither increased or decreased by use for once-through cooling. The TSS and aluminum levels discharged in the cooling water do not meet the technology-based limits for primary aluminum smelters that are based upon the amount of product produced.

Since the TSS and aluminum levels in the effluent at Outfall 001 are not fully representative of the impacts from the smelter, the NPDES permit allows Intalco to “net out” incoming pollutants in the intake water. Netting out allows Intalco to subtract the amount of TSS and aluminum in the intake water from the TSS and aluminum values in the effluent to determine compliance with effluent limits. The effluent limits established for Outfall 001 are for the net discharge of TSS and aluminum.

Netting out is allowed in federal regulation, 40 CFR 122.45(g). There is a restriction that the discharge is to the same water body as the intake water unless there is a finding of no environmental degradation. Ecology policy uses the results of whole effluent toxicity (WET) tests as the criteria for determining environmental degradation. WET tests for Outfall 001 indicate that no reasonable potential exists for acute or chronic receiving water toxicity.

The permit will be reopened and the netting out provision for TSS and aluminum will be removed if any new information, such as the results of herring bioassay testing, shows that the receiving water environment is adversely affected by TSS and/or aluminum.

#### *STORMWATER ALLOCATION AT OUTFALL 001*

After completing the diversion of stormwater from Outfall 002 to Outfall 001, the effluent limits for Outfall 001 will be adjusted to allow an allocation for the following parameters in the additional flow: TSS, aluminum, and fluoride. The stormwater allocation for each of these parameters will be determined by converting the concentration-based limit for Outfall 002 from the previous permit (1998) to a mass-based increment and adding it to the baseline effluent limit for Outfall 001. The additional stormwater flow from Outfall 002 entering Outfall 001 will be determined by continuous flow monitoring at D-10.

The maximum daily stormwater allocation for fluoride was calculated as follows:

$$Fa = Fc \times \text{flow} \times (3,785,000 \text{ l/million gallons}) / (454,000 \text{ mg/lb})$$

$$Fa = 416.9 \times \text{flow}$$

Where:

Fa = Stormwater allocation for fluoride (lb/million gallons)

Fc = Maximum daily concentration limit for fluoride in 1998 permit (50 mg/l)

flow = Stormwater flow from Outfall 002 (millions of gallons/day)

The same formula was used to calculate the average monthly stormwater allocation for fluoride and the stormwater allocations for TSS and aluminum. The allocations are tabulated below:

Parameter	Stormwater Allocation (lbs/million gallons)	
	Monthly Average	Daily Maximum
Total Suspended Solids	292	625
Fluoride	292	417
Aluminum	83	125

### ***ELIMINATING THE TOTAL SUSPENDED SOLIDS (TSS) CONCENTRATION LIMIT FOR OUTFALL 001***

The previous permit contained two separate monthly average discharge limits for Total Suspended Solids (TSS) from Outfall 001:

- 150 pounds/day (mass limit)
- 10 milligrams/liter (concentration limit)

During the permit renewal process, Intalco requested that the TSS concentration limit (10 mg/l) be eliminated from the new permit. Intalco believed that the mass limit was more stringent and thus protective of the receiving water.

Over the term of the current permit (September 1998 through the present), Intalco has exceeded the daily maximum TSS limit on two occasions. The assignable causes for both of these exceedances were related to upsets in the operation of the facility's secondary wastewater treatment plant. Intalco has never exceeded the monthly average TSS concentration limit or the monthly average TSS mass limit.

At Ecology's request, Intalco analyzed a database of over 1200 daily TSS measurements from the discharge. Intalco was able to show a correlation between TSS concentration and TSS mass discharges at Outfall 001. A monthly average discharge of TSS at a concentration of 10 mg/l is predicted to represent a mass discharge of 193 lb/day. Therefore, the 10 mg/l TSS concentration limit established in the current permit is less stringent than the 150 lb/day TSS mass limit. After reviewing Intalco's analysis, Ecology agreed that the concentration limit is less stringent than the mass-based limit and eliminated it in the proposed permit.

### ***REDUCED MONITORING FOR ANTIMONY, NICKEL, B(a)P, COPPER, CYANIDE, AND OIL AND GREASE***

According to 40 CFR 122.44(a)(2)(i), any limit that is based on federal effluent guidelines may not be removed from a permit unless the source of the pollutant has been completely eliminated and not just controlled. This rule allows a reduction in monitoring at appropriate levels. If the permittee has demonstrated with adequate historic data that they can meet the permit limit then monitoring may be reduced to once per year (the minimum required under federal rules – 40 CFR 122.44(i)(2)). If the permit limit was based on Best Professional Judgement (BPJ) and Ecology is convinced that the pollutant has no potential to cause environmental harm, the limit can be removed from the permit and replaced by reduced monitoring of the pollutant.

In the proposed permit, monitoring for antimony, nickel, B(a)P, copper, cyanide, and oil and grease at Outfalls 001 and 002 have been reduced from the previous permit. . See the discussion of production-based limits for B(a)P, antimony, and nickel in “**TECHNOLOGY-BASED EFFLUENT LIMITATIONS**” earlier in this document. See the discussion of the reduced monitoring for B(a)P, and antimony and nickel in “**PERFORMANCE-BASED REDUCTION**

**OF MONITORING FREQUENCIES”** later in this document. The Permittee is required to monitor for copper as part of the annual priority pollutant scan (PPS) at both outfalls (Condition S1.H) and is required to monitor for cyanide as part of the annual PPS at Outfall 002. The monitoring frequency for O&G was reduced to monthly for both outfalls. These monitoring changes were made based on reviews of historical monitoring data and the fact that the sources of the respective pollutants have either been eliminated or are being controlled. The following paragraphs provide information about the permittee’s management of the sources of B(a)P, copper, cyanide, and oil and grease. The limits for copper, cyanide, and oil and grease from the previous permit were not changed

### B(a)P

Benzo-a-pyrene (B(a)P) is present in very small amounts in the coal tar pitch used in the manufacture of anodes for the reduction process. Several improvements in handling practices and treatment of wastewater have reduced the likelihood of B(a)P and other related polycyclic aromatic hydrocarbons (PAH) being released to the process or stormwater outfalls. The most significant source of B(a)P discharge to the process outfall is from anode cooling water. To mitigate this potential, a filtration system has been installed to augment the existing API separator.

In the past, there was a potential for contamination of stormwater with B(a)P because off-specification materials containing B(a)P were stored outside. These off-specification materials were diverted from the anode forming process when process upsets occur and stored until they could be reused in the process. Recently, the areas where this temporary storage occurred have been covered and bermed to prevent stormwater from contacting this material and to prevent stormwater inside the berm from being released to the surrounding area. These materials are therefore no longer contributing to stormwater contamination.

Over the last permit term, 100% and 99% of the samples collected to monitor B(a)P in the discharges from Outfalls 001 and 002 respectively have been below the detection limit of 0.001 mg/l.

### Copper

The source of copper in Intalco’s wastewater is believed to be from PUD intake water. Since the copper monitoring requirement was established in Intalco’s 1998 NPDES permit, 85% of the samples collected to monitor copper have had copper concentrations below the detection limit of 6 micrograms/liter. To date, with the exception of 7 samples, all of the copper values for the 591 other samples collected were less than 15 micrograms/liter. A summary of the copper monitoring data collected over the term of the previous NPDES permit (September 1998-October 2004) is provided in Appendix I.

In October 2003, 5 samples from monitored discharges were found to contain copper concentrations above 250 micrograms/liter which were apparently false positives due to laboratory reagent water contamination. Monitoring results in December 2003 also indicated higher than normal copper concentrations. Intalco conducted an investigation of the root cause

of these high copper concentrations. Intalco sampled several potential sources of contamination and analyzed them for traces of copper. The sources included the laboratory de-ionized water system, the acid supplies used for both preservation and digestion, and a representative sampling of volumetric glassware, and digestion vessels. Although the investigation did not conclusively find the source of the contamination, all of the aforementioned except the de-ionized water system were ruled out as potential sources of copper contamination.

The samples collected from the de-ionized water system did not indicate copper contamination. However, inspection of the de-ionized water distribution discovered one faucet with a significant leak. When the valve system was removed and examined for damage, a badly corroded brass screw was found holding the washer onto the body of the valve stem. The screw was removed and replaced with a polypropylene screw. Subsequent analysis of the discharge samples for January through October 2004 show that the copper values have returned to the very low levels considered normal.

### Cyanide

The permittee maintains a triple-lined landfill on site which is used for the disposal of spent potliner (SPL). This landfill has a leachate collection system and a containment berm in place. Cyanide is a component of the SPL in the landfill. A break in the triple liner or a breach in the containment berm could result in a potential discharge of cyanide to the stormwater system.

A review of monthly discharge monitoring reports (DMR) back through January 1994 indicated that 100% of the stormwater samples collected at Outfall 002 and analyzed for cyanide were below the method detection limit of 0.005 mg/l. Given 10 years of data indicating that there has been no cyanide detected in the Outfall 002 discharge, Ecology has determined that reducing the cyanide monitoring from weekly to annually is justified.

### Oil and Grease

Intalco has made significant advances in source reduction or treatment of organic materials over the last ten years. The largest potential for oil contamination occurs in the cooling water used in the "Direct chill" or DC casting process. This water has the potential to become contaminated with oils used in the hydraulics of this process. All of the water used in the DC casting process is pumped to a cooling tower equipped with an oil flocculation and flotation process. The oil, if present, is then removed and disposed as a solid waste in an approved landfill.

Additional measures have been taken to reduce oil and grease contamination from the facility. These measures include the installation of small treatment systems to serve steam-cleaning operations at the automotive, central maintenance, and annex maintenance shops. The treatment systems consist of a coalescing filter and sand filter to remove both oil and grease and suspended solids. The waste materials from these filters are disposed as solid waste.

Frequency distributions of the Permittee's oil and grease (O&G) monitoring data collected from 1991 through 2004 for Outfalls 001 and 002 are presented in Tables 1 and 2 below. The



Practical Quantitation Limit (PQL) and the Method Detection Limit (MDL) for O&G were 1.0 mg/L and 3.0 mg/L respectively.

Table 1 – Oil & Grease Monitoring Data for Outfall 001

Concentration (mg/L) Range (Maximum Daily Permit Limit = 10 mg/L)	Frequency of Occurrence	% of Total Data in Concentration Range
0-1	2995	60.29%
1-2	1417	28.52%
2-3	382	7.69%
3-4	122	2.46%
4-5	29	0.58%
5-6	14	0.28%
6-7	6	0.12%
7-8	2	0.04%
8-9	0	0.00%
9-10	0	0.00%
>10 <sup>(1)</sup>	1	0.02%

<sup>1</sup>Occurred on July 20, 1991

Table 2 – Oil & Grease Monitoring Data for Outfall 002

Concentration (mg/L) Range (Maximum Daily Permit Limit = 10 mg/L)	Frequency of Occurrence	% of Total Data in Concentration Range
0-1	2275	46.33%
1-2	1613	32.85%
2-3	625	12.73%
3-4	250	5.09%
4-5	89	1.81%
5-6	28	0.57%
6-7	14	0.29%
7-8	14	0.29%
8-9	2	0.04%
9-10	0	0.00%
>10	0	0.00%

### ***SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS***

In order to protect existing water quality and preserve the designated beneficial uses of Washington's surface waters, WAC 173-201A-060 states that waste discharge permits shall be conditioned such that the discharge will meet established Surface Water Quality Standards. The Washington State Surface Water Quality Standards (Chapter 173-201A WAC) is a state regulation designed to protect the beneficial uses of the surface waters of the state. Surface

water quality-based effluent limitations may be based on an individual waste load allocation (WLA) or on a WLA developed during a basin wide total maximum daily loading study (TMDL).

#### **NUMERICAL CRITERIA FOR THE PROTECTION OF AQUATIC LIFE**

"Numerical" water quality criteria are numerical values set forth in the State of Washington's Water Quality Standards for Surface Waters (Chapter 173-201A WAC). They specify the levels of pollutants allowed in receiving water while remaining protective of aquatic life. Numerical criteria set forth in the Water Quality Standards are used along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limitations, they must be used in a permit.

#### **NUMERICAL CRITERIA FOR THE PROTECTION OF HUMAN HEALTH**

The U.S. EPA has promulgated 91 numeric water quality criteria for the protection of human health that are applicable to Washington State (EPA 1992). These criteria are designed to protect humans from cancer and other disease and are primarily applicable to fish and shellfish consumption and drinking water from surface waters.

#### **NARRATIVE CRITERIA**

In addition to numerical criteria, "narrative" water quality criteria (WAC 173-201A-030) limit toxic, radioactive, or deleterious material concentrations below those which have the potential to adversely affect characteristic water uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health. Narrative criteria protect the specific beneficial uses of all fresh (WAC 173-201A-130) and marine (WAC 173-201A-140) waters in the State of Washington.

#### **ANTIDEGRADATION**

The State of Washington's Antidegradation Policy requires that discharges into a receiving water shall not further degrade the existing water quality of the water body. In cases where the natural conditions of a receiving water are of lower quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. Similarly, when the natural conditions of a receiving water are of higher quality than the criteria assigned, the natural conditions shall be protected. More information on the State Antidegradation Policy can be obtained by referring to WAC 173-201A-070.

The Department has reviewed existing records and is unable to determine if ambient water quality is either higher or lower than the designated classification criteria given in Chapter 173-201A WAC; therefore, the Department will use the designated classification criteria for this water body in the proposed permit. The discharges authorized by this proposed permit should not cause a loss of beneficial uses.

## **CRITICAL CONDITIONS**

Surface water quality-based limits are derived for the waterbody's critical condition, which represents the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or characteristic water body uses.

## **MIXING ZONES**

The Water Quality Standards allow the Department of Ecology to authorize mixing zones around a point of discharge in establishing surface water quality-based effluent limits. Both "acute" and "chronic" mixing zones may be authorized for pollutants that can have a toxic effect on the aquatic environment near the point of discharge. The concentration of pollutants at the boundary of these mixing zones may not exceed the numerical criteria for that type of zone. Mixing zones can only be authorized for discharges that are receiving all known, available, and reasonable methods of prevention, control and treatment (AKART) and in accordance with other mixing zone requirements of WAC 173-201A-100.

The National Toxics Rule (EPA, 1992) allows the chronic mixing zone to be used to meet human health criteria.

## **DESCRIPTION OF THE RECEIVING WATER**

The permittee discharges to marine waters in the Strait of Georgia and is designated a Class AA water in the vicinity of Outfalls 001, 002, 003-005, 011, and 012. Characteristic uses include the following: fish migration; fish and shellfish rearing, spawning and harvesting; wildlife habitat; primary contact recreation; sport fishing; boating and aesthetic enjoyment; commerce and navigation. Water quality of this class shall markedly and uniformly exceed the requirements for all or substantially all uses.

The closest Department of Ecology long-term core monitoring station, GRG002, is located in the Strait of Georgia near Patos Island. It is far enough away from the Cherry Point industries to prevent their discharges from influencing readings taken there. There is also substantial data for this station. The station at Bellingham Bay, BLL009, is also very close but is influenced by activity in Bellingham and is not suitable for a background data station. The closest long-term rotating station is LOP001 in Lopez Sound.

## **SURFACE WATER QUALITY CRITERIA**

Applicable criteria are defined in Chapter 173-201A WAC for aquatic biota. In addition, U.S. EPA has promulgated human health criteria for toxic pollutants (EPA 1992). Criteria for this discharge are summarized below:

Fecal Coliforms	14 organisms/100 mL maximum geometric mean
Dissolved Oxygen	7.0 mg/L minimum
Temperature	13 degrees Celsius maximum or incremental increases above background
pH	7.0 to 8.5 standard units

Turbidity	less than 5 NTU above background
Toxics	No toxics in toxic amounts (see Appendix K for numeric criteria for toxics of concern for this discharge)

The Strait of Georgia is listed on the 2003/2004 Clean Water Act 303(d) list. It is listed for a variety of pollutants found in the sediments at the Intalco Aluminum Company. The following pollutants were found in the sediments around the Intalco discharge outfalls: hexachlorobenzene, bis(2-ethylhexylphthalate), dibenzofuran, phenol, PCBs, and PAHs. 1,2,4-trichlorobenzene and 1,2-dichlorobenzene were not detected but the detection limits for these parameters exceeded the *Sediment Quality Standards*.

Intalco is required to conduct additional sediment monitoring to recharacterize the sediment in the vicinity of Outfalls 001 and 002, in Condition S12. of the proposed permit.

#### **CONSIDERATION OF SURFACE WATER QUALITY-BASED LIMITS FOR NUMERIC CRITERIA**

Pollutant concentrations in the proposed discharges exceed water quality criteria with technology-based controls, which the Department has determined to be AKART. A mixing zone is authorized for each discharge in accordance with the geometric configuration, flow restriction, and other restrictions for mixing zones in Chapter 173-201A WAC and are defined as follows:

#### **DIFFUSER INFORMATION**

The diffuser at Outfall 001 is approximately 120 feet long with a diameter of 24 inches. There are 12 ports on each side (north and south faces) of the diffuser. Each port is 6 inches in diameter. The center to center distance between each of the ports is 10 feet, 8 inches. The end of the diffuser has a blind flange with a 6 inch port in the center. The mean lower low water (MLLW) depth at the diffuser is 16 feet.

The stormwater outfall (002) extends 250 feet from the shoreline. The open-ended pipe is 30 inches in diameter. The MLLW depth at the diffuser is 9 feet.

This information and additional information is available in the Dilution Ratio Study Report submitted to Ecology in September 17, 2001.

#### **CHRONIC MIXING ZONES**

WAC 173-201A-100(4) specifies that mixing zones shall not extend in any horizontal direction from the discharge ports for a distance greater than 200 feet plus the depth of water over the discharge ports as measured during MLLW. The edge of the chronic mixing zone shall also be at least 100 feet from the shoreline at MLLW.

Given a MLLW depth of 16 feet for the diffuser at Outfall 001, the horizontal distance is 216 feet. The mixing zone extends from the seabed to the top of the water surface. The horizontal distance of the chronic mixing zone at Outfall 002 is 209 feet.

## ACUTE MIXING ZONES

WAC 173-201A-100(8)(b) specifies that in estuarine waters a zone where acute criteria may be exceeded shall not extend beyond 10% of the distance established for the chronic zone. The acute mixing zone for Outfall 001 extends 22 feet in any spatial direction from any discharge port. The acute mixing zone for Outfall 002 extends 21 feet in any spatial direction from the discharge pipe.

The dilution factors of effluent to receiving water that occur within these zones have been determined by the use of a dye study and modeling. The report entitled "Effluent Plumes Modeling Study" was prepared by ENSR Consulting and Engineering in August 2001. The model used for near field effects was the EPA dilution model UDKHDEN. Far field effects were predicted using the Brooks (1960) Model of Far-field Dilution of Initially Diluted Sewage Discharges from Marine Outfalls (Fischer, et al.). The 1991 dye study and the 1992 modeling were re-analyzed in May 2004 using updated receiving water information from the report entitled "Effluent Plumes Modeling Study" was prepared by ENSR Consulting and Engineering in August 2001. The dilution factors determined from this analysis are as follows:

		Acute	Chronic
Aquatic Life	Outfall 001	40	190
	Outfall 002	5	50
Human Health, Carcinogen	Outfall 001	NA	190
	Outfall 002	NA	50
Human Health, Non-carcinogen	Outfall 001	NA	190
	Outfall 002	NA	50

Additional information regarding the updated mixing zone analysis is shown in Appendix J. A complete record of the dilution analysis for the Intalco aluminum smelter is available in Ecology's files.

Pollutants in an effluent may affect the aquatic environment near the point of discharge (near field) or at a considerable distance from the point of discharge (far field). Toxic pollutants, for example, are near-field pollutants--their adverse effects diminish rapidly with mixing in the receiving water. Conversely, a pollutant such as BOD is a far-field pollutant whose adverse effect occurs away from the discharge even after dilution has occurred. Thus, the method of calculating surface water quality-based effluent limits varies with the point at which the pollutant has its maximum effect.

The derivation of surface water quality-based limits also takes into account the variability of the pollutant concentrations in both the effluent and the receiving water.

The critical condition for the Georgia Strait at Outfalls 001 and 002 occurs during the neap tide at MLLW and with 90<sup>th</sup> percentile background pollutant concentrations. Ambient data at critical conditions in the vicinity of the two outfalls was taken from both historical data at Ecology's Ambient Monitoring Station GRG002 and an intensive monitoring study conducted in July-September 1999 entitled "Concentration of Metals in Marine Water and Effluent of the Alcoa Intalco Works," prepared by Eric Crecilius, Battelle Marine Sciences Laboratory, April 2000):

Parameter	Value Used
Temperature	19.3° C
pH (high)	7.9
Dissolved Oxygen	8.0 mg/l
Ammonia-N, total	0.45 mg/l
Cyanide, total	<0.01 mg/l
Fluoride	1.27 mg/l
Aluminum, dissolved	11.4 µg/l
Cadmium, dissolved	0.11 µg/l
Copper, dissolved	0.93 µg/l
Lead, dissolved	0.02 µg/L
Mercury	0.0012 µg/L
Zinc, dissolved	2.90 µg/L
Other Metals	Below detection limits

The impacts of dissolved oxygen deficiency, temperature, pH, turbidity, ammonia, metals, and other toxics were determined as shown below, using the dilution factors at critical conditions described above.

#### BOD<sub>5</sub>

This discharge results in a small amount of BOD loading relative to the large amount of dilution occurring in the receiving water at critical conditions. Technology-based limitations will be protective of dissolved oxygen criteria in the receiving water.

#### Temperature

The impact of the discharge on the temperature of the receiving water was modeled by a simple mixing analysis at the critical condition. The receiving water temperature at the critical condition is 13°C (TCa), the maximum effluent temperature for both Outfall 001 and Outfall 002 is 26 °C (TCe), and the dilutions at the edge of the chronic mixing zone are 198 for outfall 001 and 50 for outfall 002.

The predicted resultant temperature at the boundary of the chronic mixing zone is based on the mass balance equation:  $[TCa \times \text{dilution} + TCe] / [\text{dilution} + 1]$

$$\text{Outfall 001} = [(13^{\circ}\text{C} * 198 + 26^{\circ}\text{C}) / (198 + 1)] = 13.07^{\circ}\text{C}$$

$$\text{Outfall 002} = [(13^{\circ}\text{C} * 50 + 26^{\circ}\text{C}) / (50 + 1)] = 13.25^{\circ}\text{C}$$

The standard states that no temperature increase will be allowed which will raise the receiving water temperature by greater than 0.3 °C due to human activities. The incremental rises of 0.07 °C and 0.25 °C are less than 0.3 °C. These temperatures meet the water quality standards.

Additional, the highest recorded ambient temperature at GRG002 (from 1989 to 2002) was 19.5°C (T). The incremental temperature increase allowance  $[t = 8/(T-4)]$  is equal to 0.5°C.

With a receiving water temperature of 19.5°C and a maximum effluent temperature of 26°C the predicted temperature at the edge of the dilution zone are as follows:

$$\text{Outfall 001} = [(19.5^{\circ}\text{C} * 198 + 26^{\circ}\text{C}) / (198 + 1)] = 19.53^{\circ}\text{C}$$

$$\text{Outfall 002} = [(19.5^{\circ}\text{C} * 50 + 26^{\circ}\text{C}) / (50 + 1)] = 19.63^{\circ}\text{C}$$

The temperature increase of 0.03°C at outfall 001 and 0.13°C at outfall 002 are less than the incremental temperature allowance 0.5°C or the maximum allowable increase of 0.3°C allowed by water quality standards. Under these conditions there is no predicted violation of The Water Quality Standards.

Under critical conditions, there is no predicted violation of the Water Quality Standards for Surface Waters for Outfall 001 and 002. Therefore, it was determined that the temperature criteria would not be violated outside the designated mixing zone.

### pH

Because of the high buffering capacity of marine water, compliance with the technology-based effluent limits of 6.0 to 9.0 will assure compliance with the Water Quality Standards for Surface Waters.

### Turbidity

The impact of turbidity was evaluated based on the range of turbidity in the effluent and turbidity of the receiving water. Due to the large degree of dilution, it was determined that the turbidity criteria would not be violated outside the designated mixing zone.

### Toxic Pollutants

Federal regulations (40 CFR 122.44) require NPDES permits to contain effluent limits for toxic chemicals in an effluent whenever there is a reasonable potential for those chemicals to exceed the surface water quality criteria. This process occurs concurrently with the derivation of technology-based effluent limits. Facilities with technology-based effluent limits defined in regulation are not exempted from meeting the Water Quality Standards for Surface Waters or from having surface water quality-based effluent limits.

The following toxics were determined to be present in the discharge: ammonia, heavy metals, cyanide, phenols, and trace PAHs. A reasonable potential analysis (Appendix K) was conducted on these parameters to determine whether or not effluent limitations would be required in this permit.

Valid ambient background data was available for ammonia, total cyanide, fluoride, aluminum, dissolved cadmium, dissolved copper, dissolved lead, mercury, and dissolved zinc. Calculations using all applicable data resulted in a determination that there is no reasonable potential for this discharge to cause a violation of water quality standards (See Appendix K). This determination assumes that the Permittee meets the other effluent limits of this permit.

Water quality criteria for metals in Chapter 173-201A WAC are based on the dissolved fraction of the metal, except for arsenic and mercury.

Metal criteria may also be adjusted using the water effects ratio approach established by USEPA, as generally guided by the procedures in USEPA Water Quality Standards Handbook, December 1983, as supplemented or replaced.

### Ammonia

Ammonia is considered to be a toxic pollutant and was evaluated for reasonable potential to exceed water quality standards. Determining the site specific acute and chronic criteria for ammonia is slightly more complicated than simply obtaining the criteria from the regulations and comparing them to the effluent data. Ammonia's toxicity is dependent on that portion which is available in the unionized form. The amount of unionized ammonia is dependent on the pH, dissolved oxygen, and salinity of the receiving water in the marine environment. In order to evaluate ammonia toxicity, receiving water information must be used.

One ambient receiving water station was evaluated to determine the site-specific acute and chronic criteria and to obtain background ammonia data. The Ecology ambient monitoring station GRG002 was used in this analysis. Acute and chronic ammonia criteria were calculated using Hampson's model in a spreadsheet form. From those criteria, the 90th percentile value was chosen to represent the critical condition as recommended by the Ecology Permit Writer's Manual. The values for the ambient station and the 90th percentile values for background total ammonia concentrations were used in the reasonable potential calculation shown in Appendix K. With the available dilution, it was determined that there is no reasonable potential for Intalco to exceed water quality standards for ammonia at the edge of the dilution zone.

### **WHOLE EFFLUENT TOXICITY**

The Water Quality Standards for Surface Waters require that the effluent not cause toxic effects in the receiving waters. Many toxic pollutants cannot be detected by commonly available detection methods. However, toxicity can be measured directly by exposing living organisms to the wastewater in laboratory tests and measuring the response of the organisms. Toxicity tests measure the aggregate toxicity of the whole effluent, and therefore this approach is called whole effluent toxicity (WET) testing. Some WET tests measure acute toxicity and other WET tests measure chronic toxicity.

Acute toxicity tests measure mortality as the significant response to the toxicity of the effluent. Dischargers who monitor their wastewater with acute toxicity tests are providing an indication of the potential lethal effect of the effluent to organisms in the receiving environment.

Chronic toxicity tests measure various sublethal toxic responses such as retarded growth or reduced reproduction. Chronic toxicity tests often involve either a complete life cycle test of an organism with an extremely short life cycle or a partial life cycle test on a critical stage of one of a test organism's life cycles. Organism survival is also measured in some chronic toxicity tests.

Accredited WET testing laboratories have the proper WET testing protocols, data requirements, and reporting format. Accredited laboratories are knowledgeable about WET testing and capable



of calculating an NOEC, LC<sub>50</sub>, EC<sub>50</sub>, IC<sub>25</sub>, etc. All accredited labs have been provided the most recent version of the Department of Ecology Publication # WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria* which is referenced in the permit. Any Permittee interested in receiving a copy of this publication may call the Ecology Publications Distribution Center 360-407-7472 for a copy. Ecology recommends that Permittees send a copy of the acute and chronic toxicity sections of their permits to their laboratory of choice.

The WET tests for Outfall 001 during effluent characterization indicate that no reasonable potential exists to cause receiving water acute or chronic toxicity (See Appendix L). The Permittee will not be given an acute or chronic WET limit and will only be required to retest the effluent prior to application for permit renewal in order to demonstrate that acute toxicity has not increased in the effluent.

If the Permittee makes process or material changes which, in the Department's opinion, results in an increased potential for effluent toxicity, then the Department may require additional effluent characterization in a regulatory order, by permit modification, or in the permit renewal. Toxicity is assumed to have increased if WET testing conducted for submission with a permit application fails to meet the performance standards in WAC 173-205-020, "whole effluent toxicity performance standard". The Permittee may demonstrate to the Department that changes have not increased effluent toxicity by performing additional WET testing after the time the process or material changes have been made.

Acute toxicity of Outfall 002 was measured during compliance monitoring in the previous permit term (See Appendix L). On five occasions the acute toxicity was found to be at levels that, in accordance with WAC 173-205-050(2)(a), have a reasonable potential to cause receiving water toxicity. An acute toxicity limit is therefore required. The acute toxicity limit is no statistically significant difference in test organism survival between the acute critical effluent concentration (ACEC), 17% of the effluent, and the control.

The acute toxicity limit is set relative to the zone of acute criteria exceedance (acute mixing zone) established in accordance with WAC 173-201A-100. The ACEC is the concentration of effluent existing at the boundary of the acute mixing zone during critical conditions.

Monitoring for compliance with an acute toxicity limit is accomplished by conducting an acute toxicity test using a sample of effluent diluted to equal the ACEC and comparing test organism survival in the ACEC to survival in nontoxic control water. The Permittee is in compliance with the acute toxicity limit if there is no statistically significant difference in test organism survival between the ACEC and the control.

Chronic toxicity of Outfall 002 was also measured during compliance monitoring in the previous permit term (See Appendix L). On ten occasions the chronic toxicity was found to be at levels that, in accordance with WAC 173-205-050(2)(a), have a reasonable potential to cause receiving water toxicity. A chronic toxicity limit is therefore required. The chronic toxicity limit is no statistically significant difference in test organism response between the chronic critical effluent concentration (CCEC), 2% of the effluent, and the control.

The chronic toxicity limit is set relative to the mixing zone established in accordance with WAC 173-201A-100. The CCEC is the concentration of effluent existing at the boundary of the mixing zone during critical conditions.

Monitoring for compliance with a chronic toxicity limit is accomplished by conducting a chronic toxicity test using a sample of effluent diluted to equal the CCEC and comparing test organism response in the CCEC to organism response in nontoxic control water. The Permittee is in compliance with the chronic toxicity limit if there is no statistically significant difference in test organism response between the CCEC and the control.

### **TOXICITY IDENTIFICATION/REDUCTION (TI/RE)**

In May 1999, the stormwater discharge from Outfall 002 failed the chronic toxicity testing (WET) required in Condition S3. of the previous permit. Intalco began additional chronic testing in June 1999 per the requirements of WAC 173-205. The additional chronic testing exhibited toxicity failures. The toxicity failures triggered Intalco's permit requirement to submit a Toxicity Identification/Reduction Evaluation (TI/RE) Plan to Ecology for review and approval. The purpose of the TI/RE Plan was to evaluate and determine the source of the toxicity and to identify measures to eliminate or reduce the toxicity.

The results of Intalco's Toxicity Identification Evaluation (TIE) identified aluminum as the source of toxicity with complicating factors resulting from the presence of fluoride.

Intalco conducted an Initial Source Assessment Study in response to the TI/RE from January through March 2000. The objectives of the study were to: 1) measure the concentrations of total and soluble aluminum, fluoride, and total suspended solids (TSS) in stormwater runoff at various locations, 2) identify the areas that contain processes which are significant source contributors, 3) determine which areas would benefit from source reduction strategies and/or stormwater treatment, and 4) identify additional sampling studies to better quantify specific source contributions. Intalco conducted a Refined Source Assessment from March 2000 through June 2001 in response to the findings of the Initial Source Assessment.

In response to the TI/RE, Intalco reviewed and revised their housekeeping best management practices (BMPs) starting in June 2000. The BMPs included increased routine sweeping, covering the dross and collector bar storage areas, and instituting annual wet and dry season inspections as described in Section 10 of Intalco's Stormwater Pollution Prevention Plan.

The final report submitted by Intalco in response to the TI/RE is titled "Proposed Stormwater Pond Outfall Changes", dated October 14, 2003. In this report, Intalco proposed modifying the stormwater discharge outlet to divert stormwater through Outfall 001. Stormwater flows that exceed the hydraulic capacity of Outfall 001 would be discharged through Outfall 002. The Outfall 002 diversion is discussed in more detail later in this document.

Ecology has reviewed and approved all of the documents related to the TI/RE. Condition S.17 of the previous permit required Intalco to implement the BMPs and source reduction methods that were proposed as a result of the TI/RE. Ecology agrees that the best way to eliminate the toxicity from the Outfall 002 discharge is to redirect the stormwater discharge at Outfall 002 into Outfall 001. Condition S.1.E of the permit requires Intalco to complete the diversion within two years of the effective date of the proposed permit. Conditions S8. and S9. of the proposed permit require Intalco to recharacterize the effluent from Outfall 001 for acute and chronic toxicity.

These studies are scheduled to occur after the Outfall 002 diversion has been completed and is operational to evaluate the impacts of mixing the effluent from Outfall 002 with effluent from Outfall 001.

### **CHERRY POINT HERRING**

Over the last 20 years, there has been a severe decline in the herring stock that spawn in the Cherry Point area. In April 1998, Ecology teamed up with the Department of Fish and Wildlife, and the Department of Natural Resources to form the Cherry Point Technical Workgroup. The Cherry Point Technical Workgroup also consists of representatives from industry, environmental groups, and tribes. Through a series of studies and an ecological risk assessment model, the group has identified a number of stressors and natural conditions that may be working independently or in concert with each other to cause this effect on the herring decline. Until now, there has been no direct way to evaluate how industrial wastewater discharges may be affecting the herring at Cherry Point.

Over the last several years, Ecology has been in the process of developing WET tests using Pacific herring, a species indigenous to Puget Sound. These tests include an embryo chronic test that looks at survival and development, a prolarval test that looks at survival and a larval survival and growth chronic test. These tests will be available for regulatory use in 2005. The permit includes a requirement to conduct herring bioassay testing. These herring tests are not included in WAC 173-205-050(1)(d) at this time and cannot be used to determine the need for toxicity limits or for monitoring compliance.

### **HUMAN HEALTH**

Washington's water quality standards now include 91 numeric health-based criteria that must be considered in NPDES permits. These criteria were promulgated for the state by the U.S. EPA in its National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992).

The Department has determined that the Permittee's effluent is likely to have chemicals of concern for human health. The Permittee's high priority status is based on its status as a major discharger and knowledge of data or process information indicating that regulated chemicals occur in the discharges from the facility.

A determination of the discharge's potential to cause an exceedance of the water quality standards was conducted as required by 40 CFR 122.44(d) for Outfalls 001 and 002. The reasonable potential determination was evaluated following procedures in the Technical Support Document for Water Quality-Based Toxics Control (EPA/505/2-90-001) and the Department's Permit Writer's Manual (Ecology Publication 92-109, July, 1994). The determination indicated that the discharges from Outfalls 001 and 002 have no reasonable potential to cause a violation of water quality standards, thus an effluent limit is not warranted. See Appendix K.

### **Arsenic**

In 1992 the USEPA adopted risk-based arsenic criteria for the protection of human health for the State of Washington. The criterion for marine waters is 0.14 µg/L inorganic arsenic, and is based on exposure from fish and shellfish tissue ingestion. The freshwater criterion is 0.018

µg/L, and is based on exposure from fish and shellfish tissue and water ingestion. These criteria have caused confusion in implementation because they differ from the drinking water maximum contaminant level (MCL) of 10 µg/L, which is not risk-based, and because the human health criteria are sometimes exceeded by natural background concentrations of arsenic in surface water and ground water.

In Washington, when a natural background concentration exceeds the criterion, the natural background concentration becomes the criterion, and no dilution zone is allowed. This could result in a situation where natural groundwater or surface water used as a municipal or industrial source-water would need additional treatment to meet numeric effluent limits even though no arsenic was added as waste. Although this is not the case for all dischargers, we do not have data at this time to quantify the extent of the problem.

A regulatory mechanism to deal with the issues associated with natural background concentrations of arsenic in groundwater-derived drinking waters is currently lacking. Consequently, the Water Quality Program, at this time, has decided to use a three-pronged strategy to address the issues associated with the arsenic criteria. The three strategy elements are:

- 1. Pursue, at the national level, a solution to the regulatory issue of groundwater sources with high arsenic concentrations causing municipal treatment plant effluent to exceed criteria.** The revision of the drinking water MCL for arsenic offered a national opportunity to discuss how drinking water sources can affect NPDES wastewater dischargers, however Ecology was unsuccessful in focusing the discussion on developing a national policy for arsenic regulation that acknowledges the risks and costs associated with management of the public exposure to natural background concentrations of arsenic through water sources. The current arsenic MCL of 10 µg/L could also result in municipal treatment plants being unable to meet criteria-based effluent limits. Ecology will continue to pursue this issue as opportunities arise.
- 2. Additional and more focused data collection.** The Water Quality Program will in some cases require additional and more focused arsenic data collection, will encourage or require dischargers to test for source water arsenic concentrations, and will pursue development of a proposal to have Ecology's Environmental Assessment Program conduct drinking water source monitoring as well as some additional ambient monitoring data. At this time, Washington NPDES permits will contain numeric effluent limits for arsenic based only on treatment technology and aquatic life protection as appropriate.
- 3. Data sharing.** Ecology will share data with USEPA as they work to develop new risk-based criteria for arsenic and as they develop a strategy to regulate arsenic.

## **SEDIMENT QUALITY**

The Department has promulgated aquatic sediment standards (Chapter 173-204 WAC) to protect aquatic biota and human health. These standards state that the Department may require Permittees to evaluate the potential for the discharge to cause a violation of applicable standards (WAC 173-204-400).

In September 1999, Intalco conducted a marine sediment sampling and analysis study. The purpose of the Fall 1999 study was to 1) comply with the current NPDES permit sediment monitoring requirements, 2) determine if sediment remedial actions were necessary, and 3) evaluate sediment quality concerns related to the Department of Natural Resources (DNR) lease requirements. To meet these objectives, the study focused on: characterizing chemicals of potential concern (COC), concentrations and biological effects within and adjacent to the NPDES outfall mixing zones, analyzing facility process indicator chemicals including aluminum, fluoride, and cyanide, and analyzing select samples for the full suite of Sediment Management Standard (SMS) chemicals.

Sediment was collected and analyzed from depths of 2 cm and 10 cm in order to assess sediment quality in the areas of ongoing discharge and in the biologically active zone, respectively. COCs were determined to be LPAHs, HPAHs, PCBs, and various semi-volatile organic compounds. The full suite of SMS chemicals were analyzed at stations in areas that had not been previously characterized.

The sediment sampling found Sediment Quality Standard (SQS) and cleanup screening level (CSL) exceedances of both PCBs and PAHs at the 2 cm and 10 cm depths near both outfalls. Other chemical exceedances included bis(2-ethylhexylphthalate), dibenzofuran, and phenol.

The aluminum, fluoride, and phenol concentrations in the sediment were found to be equivalent to those found in reference samples collected in the Carr Inlet. The levels of phenols are believed to be due to the decomposition of coniferous wastes. Cyanide was not detected in any of the sediments collected during the investigation. The detection of chemicals that exceeded SQS chemical criteria was consistent with historical sampling data.

Confirmatory bioassays were performed on 10 cm samples that exceeded the SQS chemical criteria. No adverse biological effects were found in any of the sediment samples indicating that elevated chemical concentrations in sediments adjacent to the Intalco facility were not associated with adverse ecological effects.

After a review of the chemistry and bioassay data collected during the 1999 study, Ecology agreed that remedial cleanup action of the sediments adjacent to Intalco is not necessary. However, chemical exceedances in surface sediments remain a concern. Chemical exceedances at a depth of 10 cm near the process and stormwater outfalls may represent effects from the current discharges or another continuing source and need further investigation. Condition S12. of the proposed permit includes a requirement to conduct additional sediment sampling and analyses for PAHs, PCBs, aluminum, fluoride, and cyanide. The sediment recharacterization is required later in the permit term to evaluate sediment condition following the clean-up and closure of the Beach and Construction Landfills as discussed later in this document.

## **FUGITIVE ALUMINA IMPACT STUDY**

Concerns have been raised about the spillage of alumina ore during ship unloading and its possible accumulation in sediments around Intalco's marine terminal. In December 1999, Intalco submitted a notice of construction application requesting approval to upgrade their alumina ore unloading air pollution control system. Ecology reviewed the application and issued

an order of approval to upgrade the control system. After the approval order was issued, Intalco determined that their pier was not structurally able to accommodate the proposed upgrades and the upgrades were not installed.

Since Intalco determined that the control system could not be upgraded, Intalco has made a considerable investment of resources into upgrading and maintaining the integrity of the seal on the clamshell and into operating the clamshell to minimize fugitive emissions. Intalco has also implemented a number of BMPs to minimize the fugitive emissions. Currently most of the alumina ore fugitive emissions are generated as the clamshell is lifted out of the ships hold. Based on the evaluations that have been made and the results of the BMPs that have been implemented, it is not likely that Intalco will be able to further reduce or eliminate alumina ore fugitive emissions.

Ecology is planning to issue an order under their air and water quality authorities that will require Intalco to evaluate the potential impact of fugitive emissions from alumina ore unloading on sediments near the Intalco pier. If the evaluation determines that there is a significant impact to sediments, Ecology will require Intalco to propose a method(s) to mitigate that impact.

#### **GROUND WATER QUALITY LIMITATIONS**

The Department has promulgated Ground Water Quality Standards (Chapter 173-200 WAC) to protect beneficial uses of ground water. Permits issued by the Department shall be conditioned in such a manner so as not to allow violations of those standards (WAC 173-200-100).

The stormwater pond and sanitary lagoon in Intalco's wastewater treatment system have unlined native clay bottoms and could potentially discharge to ground water. To determine the need for a groundwater impact study, the effluent from the stormwater pond was compared to the Ground Water Quality Standards (GWQS) (see Appendix M). In that comparison, fluoride, arsenic, and B(a)P levels in the effluent exceeded the GWQS. Pesticides, radionuclides, PCBs, PBBs and dioxin were presumed to be absent or not present in detectable quantities, based on past test results and process knowledge.

Based on this analysis, Ecology determined that there is a potential for an impact to ground water beneath the stormwater pond. Data was not available for the sanitary lagoon. As a result Intalco will be required to submit a ground water impact study plan to be implemented in the third and fourth year of the proposed permit. The plan must include sampling and testing schedules for the stormwater pond and sanitary lagoon for all of the parameters included in the GWQS (except pesticides, radionuclides, PBBs and dioxin), and a hydrogeologic investigation to estimate the impact to ground water. If this study determines that there is a potential for the effluent from the stormwater pond or sanitary lagoon to cause an exceedance of the GWQS, Intalco will be required to install monitoring wells to investigate any actual effects on the ground water.

**COMPARISON OF EFFLUENT LIMITS WITH THE EXISTING PERMIT ISSUED ON SEPTEMBER 1, 1998**

<b>Effluent Limitations: Outfall # 001</b>					
		<b>Existing Permit</b>		<b>Proposed Permit</b>	
<b>Parameter</b>	<b>Units</b>	<b>Monthly Average</b>	<b>Daily Maximum</b>	<b>Monthly Average</b>	<b>Daily Maximum</b>
Total Suspended Solids	lbs/day	150	185	150	185
	mg/l	10	--	--	--
Fluoride	lbs/day	68	296	68	296
Aluminum	lbs/day	10.3	30	10.3	30
Free Cyanide	mg/l	<0.012	0.012	<0.012	0.012
Benzo(a)Pyrene	mg/l	<0.01	0.01	0.06 lb/day	0.13 lb/day
Antimony	NL <sup>1</sup>	NL <sup>1</sup>	NL <sup>1</sup>	5.7 lb/day	12.8 lb/day
Nickel	NL <sup>1</sup>	NL <sup>1</sup>	NL <sup>1</sup>	2.5 lb/day	3.7 lb/day
Oil and Grease	mg/l	5	10	5	10
pH		Within the range of 6.0 - 9.0		Within the range of 6.0 - 9.0	

<b>Effluent Limitations: Outfall # 002</b>					
		<b>Existing Permit</b>		<b>Proposed Permit</b>	
<b>Parameter</b>	<b>Units</b>	<b>Monthly Average</b>	<b>Daily Maximum</b>	<b>Monthly Average</b>	<b>Daily Maximum</b>
Total Suspended Solids	mg/l	35	75	35	75
Fluoride	mg/l	35	50	35	50
Aluminum	mg/l	10	15	10	15
Free Cyanide	mg/l	--	--	--	--

Benzo(a)Pyrene	mg/l	--	<0.01	--	<0.01
Oil and Grease	mg/l	5	10	5	10
pH		Within the range of 6.0 - 9.0		Within the range of 6.0 - 9.0	

<b>Effluent Limitations: Sanitary Lagoon</b>					
		<b>Existing Permit</b>		<b>Proposed Permit</b>	
<b>Parameter</b>	<b>Units</b>	<b>30-Day Average</b>	<b>7-Day Average</b>	<b>30-Day Average</b>	<b>7-Day Average</b>
Biochemical Oxygen Demand	mg/l	45.0	65.0	45.0	65.0
	lbs/day	22.4	32.4	22.4	32.4
Total Suspended Solids	mg/l	45.0	65.0	45.0	65.0
	lbs/day	22.4	32.4	22.4	32.4
Fecal Coliform	Colonies/100 ml	200	400	200	400
Chlorine	mg/l	<0.012	0.012	--	--
Minimum Number of Operating Tubes		--		12	
pH		Within the range of 6.0 - 9.0		Within the range of 6.0 - 9.0	

## **MONITORING REQUIREMENTS**

Monitoring, recording, and reporting are required (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and the effluent limitations are being achieved.

The monitoring schedule is detailed in the proposed permit under Condition S1. Specified monitoring frequencies take into account the quantity and variability of the discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring.

### ***PERFORMANCE-BASED REDUCTION OF MONITORING FREQUENCIES***

EPA published guidance in April of 1996 entitled, "Interim Guidance for Performance-Based Reduction of NPDES Permit Monitoring Frequencies". EPA's goal is to reduce the regulatory burden associated with reporting and monitoring on the basis of excellent performance. The guidance recommends looking at and comparing long term average values to permit limits to evaluate a facility's performance.

Several parameters in Intalco's treated effluent were evaluated using this guidance. In addition to using the approach recommended in the guidance, maximum values were also compared with



permit limits. **Appendix O** summarizes the current and proposed monitoring frequencies based on two years of representative monitoring data (January 2000 – December 2002).

For the parameters evaluated, Intalco's monitoring history has demonstrated an ability to consistently meet regulatory limits and knowledge of the treatment system operation. The proposed monitoring frequencies are based on the guidance recommendations and best professional judgment.

Ecology deviated from the policy recommendations for fluoride and cyanide at Outfall 001 and fluoride and aluminum at Outfall 002 by increasing monitoring upstream at the secondary treatment plant and the stormwater pond. The monitoring frequencies for antimony and nickel, B(a)P, copper, and oil and grease at Outfall 001 and copper, cyanide, B(a)P, and oil and grease at Outfall 002 were further reduced because years of monitoring data and other plant knowledge have shown that the sources of these pollutants either no longer exist or have been controlled. More detailed information about these specific pollutants is discussed earlier in this document.

#### B(a)P

Intalco conducted weekly B(a)P monitoring of Outfall 001 from April 1991 through September 1998 and monthly monitoring since October 1998. The Outfall 001 data indicates that B(a)P concentrations have not been above the detection limit (0.001 mg/L) since February 1996. Prior to that, there were 10 occasions (between June 1995 and February 1996) when B(a)P was above the detection level (the highest level of B(a)P of those 10 occasions was 0.016 lb/day). Using the maximum water flow at Outfall 001 (3.5 million gallons per day), the 0.001 mg/L concentration translates to a long term average (LTA) of 0.03 lb/day which is 50% of the monthly average maximum permit limit (0.06 lb/day). The highest level (0.016 lb/day) reported is 12% of the daily maximum permit limit (0.13 lb/day).

Ecology determined a monitoring frequency of once per quarter for B(a)P based on the previous monitoring frequency (once per month) and the ratio of the LTA to the monthly average permit limit as outlined in EPA's "Interim Guidance for Performance-Based Reduction of NPDES Permit Monitoring Frequencies" dated April 1996 (EPA's Guidance). In EPA's Guidance, the 50% ratio of LTA to the monthly average limit for B(a)P is the lowest ratio in the range (65-50%) requiring monitoring once per month. Because of the low incidence of B(a)P levels reported above the detection level in the historical data, Ecology determined that requiring monitoring once per quarter from the 49-25% range is appropriate.

#### Antimony and Nickel

As discussed earlier in "**TECHNOLOGY-BASED EFFLUENT LIMITATIONS**", Ecology added mass-based limits (at Outfall 001) for antimony and nickel to this permit. Ecology reviewed the historical antimony and nickel data collected from 1988-1998 at Outfall 001. The table below provides a frequency distribution of that data. The data indicates that a significant amount of the total nickel and antimony in the effluent comes into the plant in the water supplied by the Public Utility District. The LTA of antimony (0.206 lb/day) is 4% of the monthly average maximum permit limit (5.7 lb/day). The highest level of antimony reported (0.375 lb/day) is 3% of the daily maximum limit (12.8 lb/day). The LTA of nickel (0.198 lb/day) is 8% of the monthly average maximum permit limit (2.5 lb/day). The highest level of nickel reported (0.646 lb/day) is 17% of the daily maximum limit (3.7 lb/day).

### **Frequency Distribution of Antimony and Nickel Daily Mass Discharge Data (1988-1998)**

Metal Concentration Range	Effluent Nickel	Influent Nickel	Effluent Antimony	Influent Antimony
0.0-0.2 lb/day	174	195	121	50
0.2-0.4 lb/day	88	87	159	236
0.4-0.6 lb/day	14	4	0	0
0.6-0.8 lb/day	4	0	0	0
0.8-1.0 lb/day	0	0	0	0

Ecology determined a monitoring frequency of twice per year for antimony and nickel based on the previous monitoring frequency (once per month) and the ratio of the LTA to the monthly average permit limit (<25%) as outlined in EPA's Guidance

### ***ACTION LEVELS FOR POLLUTANTS DISCHARGED FROM THE STORMWATER POND AND THE SECONDARY WASTEWATER TREATMENT SYSTEM***

Ecology established “action levels” in the permit for TSS, fluoride, and aluminum discharged in the stormwater pond (SWP) effluent and for TSS and fluoride discharged in the Secondary WWT system effluent. These action levels were placed in the permit to ensure that the permittee is consistently implementing the required BMPs designed to reduce or eliminate the respective pollutants, evaluating the cause of any upward trends in pollutant discharges, and taking corrective action to reverse those trends. Ecology determined the action levels for the SWP and the SWTS based on an analysis of the 2003 and 2004 monthly monitoring data submitted by the permittee in their discharge monitoring reports (DMRs).

The Permittee is required to conduct a root cause analysis (RCA) when the respective action levels are exceeded. The RCA for the SWP includes reviewing BMPs, checking for spills to the stormwater system, and checking ditches and weir integrity and placement. The RCA for the SWTS includes a review of BMPs, checking the addition rates of treatment chemicals, and checking influent flows and loadings.

### ***LANDFILL MONITORING***

Intalco signed an Agreed Order with Ecology for the remedial investigation and feasibility study of three historic landfills on its property in Ferndale, Washington under the Model Toxics Control Act (MTCA). The three landfills -- known as Beach One, Beach Two, and the Construction Debris Landfill -- were used from 1965 until the 1970s and early 1980s to dispose of industrial solid waste generated at the Intalco plant. The landfills are located on bluffs above the Straight of Georgia.

The Agreed Order required Intalco to determine the volume and type of material found in each landfill and to characterize any surface or ground water contamination from the landfills. This

information was used as the basis for evaluating the different cleanup methods that were most appropriate for the site. The cleanup plan for the site is to remove the debris from the two Beach Landfills on the bluffs and place it in the permitted hazardous and solid waste landfill (Spent Potliner (SPL) Landfill) on the Intalco property and to close and cap the Construction Debris Landfill in place. Cleanup work is scheduled to begin in the summer of 2005. This work will be performed under a consent decree issued by Ecology.

Intalco stopped using the landfills in 1984 and closed them by placing soil covers over the debris. Intalco has been monitoring seeps located in the hillside below the closed landfills since 1985. While there has been no determination of an immediate threat to human health or the environment from contaminants leaving the site, in November 1999, tests at three landfill monitoring stations (Outfalls 003, 004, and 005) indicated contaminants from the landfills may be leaching into surface water runoff.

The results of the November 1999 monitoring as compared to current stormwater limits and the marine water quality standards are shown in **Appendix N**. The majority of the results exceed both stormwater limits and surface water quality standards.

The NPDES permit requires that Intalco continue monitoring of the landfill seeps (Outfalls 003, 004, and 005) until the landfills are cleaned up and closed. The permit also includes new monitoring requirements at the Secondary Treatment Plant to test for PCBs and priority pollutant metals in the leachate from the SPL Landfill once the material from beach landfills is moved to the SPL Landfill. Groundwater monitoring will be required as part of the MTCA cleanup to evaluate impacts to groundwater from the closed landfills.

### ***STORMWATER POND MONITORING***

Condition S.1.D of the proposed permit requires Intalco to monitor the stormwater pond effluent whenever the average 2-hour flow from the stormwater pond is  $\geq 3.7$  cfs (with a maximum required frequency of 3 days per week). Intalco determined, based on the results of their Stormwater Pond Characterization Study, that the minimum rainfall that occurs before significant flow begins at compliance point D-10 is about 0.05 inches of rainfall or 0.20 million gallons, which is one-tenth of the design storm volume. A volume of 0.20 million gallons is equal to a 3.7 cfs flow rate over a two hour time interval. After evaluating Intalco's precipitation data for January 2002 through September 2004, Ecology determined that a stormwater pond monitoring frequency based on the threshold volume of 3.7 cfs would be sufficient.

Intalco will be expected to maintain historic performance levels to continue to receive the reduced monitoring. If the performance levels of the facility deteriorate, monitoring frequencies will revert to the frequencies in the current permit.

### ***EFFLUENT LIMITS BELOW QUANTITATION***

The water quality-based effluent limits for cyanide in the wastewater are below the capability of current analytical technology to quantify. The Quantitation Level is the level at which concentrations can be reliably reported with a specified level of error. For maximum daily

effluent limits, if the measured effluent concentration is below the Quantitation Level, the Permittee reports NQ for non-quantifiable. For average monthly effluent limits, all effluent concentrations below the Quantitation Level but above the Method Detection Level are used as reported for calculating the average monthly value.

### ***EFFLUENT LIMITS BELOW DETECTION***

The Method Detection Level (MDL) is the minimum concentration of an analyte that can be measured and reported with a 99 percent confidence that its concentration is greater than zero as determined by a specific laboratory method. For maximum daily limits, if the concentrations are below the MDL the Permittee reports ND for non-detectable. For average monthly limits, all values above the MDL are used as reported and all values below the MDL are calculated as zero.

### ***LAB ACCREDITATION***

With the exception of certain parameters the permit requires all monitoring data to be prepared by a laboratory registered or accredited under the provisions of Chapter 173-50 WAC, *Accreditation of Environmental Laboratories*. The Intalco laboratory is currently accredited for:

Chloride	SM4500-Cl E
Chlorine Residual, Total	SM4500-Cl G
Cyanide, Total	EPA335.3
Cyanide, Weak Acid Dissociable	SM4500-CN I
Fluoride	SM4500-F E
Hexane Extractable Material	EPA1664
pH	SM4500-H
Solids, Total Suspended	SM2540 D
Specific Conductance	EPA120.1
Sulfate	SM4500-SO4 F
Aluminum	EPA200.7, EPA6010
Calcium	EPA200.7, EPA6010
Copper	EPA200.7, EPA6010
Potassium	SM3500-K B
Sodium	EPA200.7, EPA6010

## **OTHER PERMIT CONDITIONS**

### ***TEMPORARY CURTAILMENT***

A condition is included in the permit allowing reduced monitoring and the suspension of studies and certain permit requirements during temporary curtailment of smelter operations.

### ***OUTFALL 002 DIVERSION***

A compliance schedule has been included in the permit requiring that Intalco construct a diversion structure so that nearly all stormwater would discharge through Outfall 001 (process water outfall) rather than Outfall 002 (the existing stormwater outfall). Only stormwater flows in excess of the hydraulic capacity of Outfall 001 would be discharged through Outfall 002. It is predicted that a discharge of stormwater through Outfall 002 would occur very infrequently, approximately once every five years or less. This discharge would take place during a high volume short duration rain event, typically during winter or spring months.

As discussed elsewhere in the fact sheet, Intalco has a history of toxicity problems in the discharge from Outfall 002. The sources of many of these problems have been corrected and will continue to be addressed by implementing and following BMPs at the smelter. However, the location of the Outfall 002 structure is an ongoing concern; it currently discharges to fairly shallow water and is not equipped with a diffuser. Stormwater discharged through Outfall 002 has the potential to cause toxicity and temperature impacts in the receiving water despite Intalco's ability to comply with permit limits and water quality standards at the edge of the mixing zone.

Receiving water temperature and toxicity are of particular concern because of the presence of Cherry Point herring. Cherry Point herring have historically spawned in the vicinity of and at the depth of the discharge of Outfall 002. The Cherry Point herring's rate of development is temperature dependent and there has been a demonstrated increase in receiving water temperature in their spawning areas. The water quality standards may be revised to mitigate the impact of increasing temperatures.

Cherry Point herring populations are currently rebounding after being severely depressed to near extinction and they may be listed as an endangered species. The receiving water environment needs to be properly managed so that the herring stock continue to increase their numbers and have every chance so that they can rebuild.

Ecology has determined that the best way to minimize toxicity and temperature impacts in the receiving water is to require Intalco to divert the Outfall 002 discharge through Outfall 001. Outfall 001 is in deeper water and discharges through a diffuser away from the herring spawning habitat. It has better dilution within the mixing zone so discharging stormwater from Outfall 002 to Outfall 001 will provide greater water quality protection.

Following the diversion, monitoring will continue at the outlet of the stormwater pond to ensure the effectiveness of upstream treatment. The permit specifies action levels for the stormwater discharge at which Intalco will be required to investigate potential problems and take corrective action as necessary. The permit also requires monitoring for any discharges at Outfall 002 after the diversion.

### ***REPORTING AND RECORDKEEPING***

The conditions of S2. of the proposed permit are based on the authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 173-220-210).

### ***OPERATION AND MAINTENANCE MANUAL***

In accordance with state and federal regulations, the Permittee is required to take all reasonable steps to properly operate and maintain their wastewater treatment systems (40 CFR 122.41(e)) and WAC 173-220-150 (1)(g). An operation and maintenance (O & M) manual was submitted as required by state regulation for the construction of wastewater treatment facilities (WAC 173-240-150). It has been determined that the implementation of the procedures in the O & M manual and Treatment System Operating Plan is a reasonable measure to ensure compliance with the terms and limitations in the proposed permit.

### ***SOLID WASTE PLAN***

The Department has determined that the Permittee has a potential to cause pollution of the waters of the state from leachate of solid waste.

This proposed permit requires, under the authority of RCW 90.48.080, that the Permittee update the solid waste plan designed to prevent solid waste from causing pollution of the waters of the state. The plan must be submitted to the local permitting agency for approval, if necessary, and to the Department.

The Permittee shall not allow leachate from its solid waste material to enter state waters without providing all known, available, and reasonable methods of treatment, nor allow such leachate to cause violations of the State Surface Water Quality Standards, Chapter 173-201A WAC, or the State Ground Water Quality Standards, Chapter 173-200 WAC. The Permittee shall apply for a permit or permit modification as may be required for such discharges to state ground or surface waters.

The permittee shall manage the pile of furnace brick from the anode plant located adjacent to the solid waste landfill in accordance with the management plan required by the Whatcom County Health Department. The management plan shall emphasize recycling as much of the brick as possible and disposing of the remainder in the on-site landfill.

## ***NON-ROUTINE AND UNANTICIPATED DISCHARGES***

Occasionally, this facility may generate wastewater which is not characterized in their permit application because it is not a routine discharge and was not anticipated at the time of application. This wastewater is typically water used to pressure test storage tanks or fire water systems or leaks from drinking water systems. It is typically clean but may be contaminated with pollutants. The permit contains an authorization for non-routine and unanticipated discharges. The authorization requires prior characterization of these wastewaters for pollutants and examination of the opportunities for reuse. Depending on the nature and extent of pollutants in this wastewater and opportunities for reuse, Ecology may authorize a direct discharge via the process wastewater outfall or through a stormwater outfall for clean water, require the wastewater to be placed through the facilities wastewater treatment process, or require the water to be reused.

## ***SPILL PLAN***

The Department has determined that the Permittee stores a quantity of chemicals that have the potential to cause water pollution if accidentally released. The Department has the authority to require the Permittee to develop best management plans to prevent this accidental release under section 402(a)(1) of the Federal Water Pollution Control Act (FWPCA) and RCW 90.48.080.

The Permittee has developed a plan for preventing the accidental release of pollutants to state waters and for minimizing damages if such a spill occurs. The proposed permit requires the Permittee to update this plan and submit it to the Department.

## ***TREATMENT EFFICIENCY STUDIES***

### **PRIMARY WASTEWATER TREATMENT SYSTEM (PWTS)**

Intalco is required to operate process wastewater treatment systems according to procedures and criteria described in an operating plan. The previous permit required Intalco to update and maintain operational plans onsite for the process wastewater treatment systems. Intalco's PWTS is a clarifier that is used to treat the wastewater from the wet air pollution control system (wet scrubbers). Most of the water treated in the PWTS system is recycled back into the wet scrubbers and the remainder is treated in Intalco's secondary wastewater treatment system along with leachate from Intalco's hazardous waste landfill. Intalco has not updated the operational plan for the PWTS. Condition S11.A of the proposed permit requires Intalco to conduct a treatment efficiency study on the PWTS to determine if it is meeting its design criteria and to propose and implement any changes needed to upgrade the system.

### **ANODE COOLING WATER**

Anode contact water is generated during the anode production process. This wastewater is filtered through a screen before it is commingled with other treated wastewaters and discharged through Outfall 001.

Ecology is requiring Intalco (Condition S11.C of the proposed permit) to complete a study of the anode contact cooling water filtration system to determine if it meets AKART standards. If the

system does not meet AKART, Intalco will be required to upgrade the system to AKART standards.

### ***OUTFALL EVALUATION***

In accordance with Condition S.4 of the previous permit, Intalco conducted an underwater inspection of Outfalls 001 and 002 in June 1999. Overall, both outfalls were in good condition. No significant damage or deterioration to the pipes was found. At Outfall 001, the clamp bolts located at Bent 64 were loose and the vertical support rod on Bent 65 was malfunctioning due to a failed weld at the pipe clamp connection. Intalco replaced the bolts on the pipe clamp at Bent 64 and the support rod at Bent 65 and removed marine organisms fouling the diffuser openings during the scheduled pier maintenance program in 2000.

Condition S14. in the proposed permit requires the Permittee to conduct an outfall inspection once per permit cycle and submit a report detailing the findings of that inspection. The purpose of the inspection is to determine the condition of the discharge pipe and diffusers and to evaluate the extent of sediment accumulations in the vicinity of the outfall.

### ***BEST MANAGEMENT PRACTICES***

Condition S17. of the proposed permit requires Intalco to implement and follow BMPs that will help to further reduce or eliminate pollutants in the process and stormwater that is discharged to Outfalls 001 and 002, respectively. Those BMPs were identified in Intalco's Stormwater Pollution Prevention Plan and in their Stormwater Runoff Study Final Report (in the sections titled "As-Built Pond Engineering Report", "Site Hydrologic Characterization", Rainfall Characterization", "Stormwater Model", and "Stormwater pond Characterization") submitted in compliance with Conditions S.9 and S.11 of the previous permit.

The stormwater BMPs required in the proposed permit generally fall into two categories, non-capital and capital improvements. Non-capital improvements are BMPs that eliminate or minimize exposure of stormwater runoff to pollutants. These BMPs include good housekeeping, preventive maintenance, inspections, sediment/erosion control, employee training, spill prevention and cleanup measures. Capital improvements are BMPs which prevent runoff from contacting storm water or which contain/divert/treat contaminated stormwater discharges so that they do not impact surface waters. These BMPs require capital expenditures and include detention/retention ponds, berms, treatment systems, covering systems, and stormwater diversions.

### ***GENERAL CONDITIONS***

General Conditions are based directly on state and federal law and regulations and have been standardized for all individual industrial NPDES permits issued by the Department.



## **PERMIT ISSUANCE PROCEDURES**

### ***PERMIT MODIFICATIONS***

The Department may modify this permit to impose numerical limitations, if necessary to meet Water Quality Standards for Surface Waters, Sediment Quality Standards, or Water Quality Standards for Ground Waters, based on new information obtained from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

The Department may also modify this permit as a result of new or amended state or federal regulations.

### ***RECOMMENDATION FOR PERMIT ISSUANCE***

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to control toxics, protect human health, aquatic life, and the beneficial uses of waters of the State of Washington. The Department is recommending that this proposed permit be issued for (5) years.

### **REFERENCES FOR TEXT AND APPENDICES**

Environmental Protection Agency (EPA)

1992. National Toxics Rule. Federal Register, V. 57, No. 246, Tuesday, December 22, 1992.

1991. Technical Support Document for Water Quality-based Toxics Control. EPA/505/2-90-001.

1985. Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water. EPA/600/6-85/002a.

1983. Water Quality Standards Handbook. USEPA Office of Water, Washington, D.C.

Tsivoglou, E.C., and J.R. Wallace.

Washington State Department of Ecology.

1994. Permit Writer's Manual. Publication Number 92-109

Washington State Department of Ecology.

Laws and Regulations( <http://www.ecy.wa.gov/laws-rules/index.html> )

Permit and Wastewater Related Information

(<http://www.ecy.wa.gov/programs/wq/wastewater/index.html>)

Wright, R.M., and A.J. McDonnell.

Fischer, H.B., E.F. List, R.C.Y. Koh, J. Imberger, and N.H. Brooks, 1979. Mixing in Inland and Coastal Waters, Academic Press, Inc., Harcourt Brace Jovanovich Publishers, New York NW, pp. 126-127.

## APPENDIX A--PUBLIC INVOLVEMENT INFORMATION

The Department has tentatively determined to reissue a permit to the Intalco Aluminum Corporation. The permit contains conditions and effluent limitations that are described in this fact sheet.

The Department will publish a Public Notice of Draft (PNOD) on May 11, 2005 in the Bellingham Herald and the Ferndale Westside Record Journal to inform the public that a draft permit and fact sheet are available for review. Interested persons are invited to submit written comments regarding the draft permit. The draft permit, fact sheet, and related documents are available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the Ecology office listed below. Written comments should be mailed to:

Judy Schwieters  
Department of Ecology  
Industrial Section  
P.O. Box 47706  
Olympia, WA 98504-7706

Any interested party may comment on the draft permit or request a public hearing on this draft permit within the sixty (60) day comment period. All comments and requests for a hearing must be submitted in writing to the address above by the 5:00 p.m. on Monday July 11, 2005. The request for a hearing shall indicate the interest of the party and reasons why the hearing is warranted. The Department will hold a hearing if it determines there is a significant public interest in the draft permit (WAC 173-220-090). Public notice regarding any hearing will be circulated at least thirty (30) days in advance of the hearing. People expressing an interest in this permit will be mailed an individual notice of hearing (WAC 173-220-100).

Comments should reference specific text followed by proposed modification or concern when possible. Comments may address technical issues, accuracy and completeness of information, the scope of the facility's proposed coverage, adequacy of environmental protection, permit conditions, or any other concern that would result from issuance of this permit.

The Department will consider all comments received within thirty (30) days from the date of public notice of draft indicated above, in formulating a final determination to issue, revise, or deny the permit. The Department's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

Further information may be obtained from the Department by telephone, (360) 407-6955, or by writing to the address listed above.

This permit and fact sheet were written by **Liem Nguyen and Judy Schwieters.**

## APPENDIX B--GLOSSARY

**Acute Toxicity**--The lethal effect of a compound on an organism that occurs in a short period of time, usually 48 to 96 hours.

**AKART**-- An acronym for “all known, available, and reasonable methods of treatment”.

**Ambient Water Quality**--The existing environmental condition of the water in a receiving water body.

**Ammonia**--Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

**Average Monthly Discharge Limitation** --The average of the measured values obtained over a calendar month's time.

**Best Management Practices (BMPs)**--Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

**BOD<sub>5</sub>**--Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD<sub>5</sub> is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

**Bypass**--The intentional diversion of waste streams from any portion of a treatment facility.

**Chlorine**--Chlorine is used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

**Chronic Toxicity**--The effect of a compound on an organism over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

**Clean Water Act (CWA)**--The Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

**Compliance Inspection - Without Sampling**--A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

**Compliance Inspection - With Sampling**--A site visit to accomplish the purpose of a Compliance Inspection - Without Sampling and as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the 85 percent removal requirement. Additional sampling may be conducted.

**Composite Sample**--A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing discrete samples. May be "time-composite"(collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots.

**Construction Activity**--Clearing, grading, excavation and any other activity which disturbs the surface of the land. Such activities may include road building, construction of residential houses, office buildings, or industrial buildings, and demolition activity.

**Continuous Monitoring** --Uninterrupted, unless otherwise noted in the permit.

**Critical Condition**--The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

**Dilution Factor**--A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the percent effluent fraction e.g., a dilution factor of 10 means the effluent comprises 10% by volume and the receiving water 90%.

**Engineering Report**--A document which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall contain the appropriate information required in WAC 173-240-060 or 173-240-130.

**Fecal Coliform Bacteria**--Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

**Grab Sample**--A single sample or measurement taken at a specific time or over a short period of time as is feasible.

**Industrial Wastewater**--Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource, or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

**Major Facility**--A facility discharging to surface water with an EPA rating score of > 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

**Maximum Daily Discharge Limitation**--The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

**Method Detection Level (MDL)**--The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is above zero and is determined from analysis of a sample in a given matrix containing the analyte.

**Minor Facility**--A facility discharging to surface water with an EPA rating score of < 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

**Mixing Zone**--An area that surrounds an effluent discharge within which water quality criteria may be exceeded. The area of the authorized mixing zone is specified in a facility's permit and follows procedures outlined in state regulations (Chapter 173-201A WAC).

**National Pollutant Discharge Elimination System (NPDES)**--The NPDES (Section 402 of the Clean Water Act) is the Federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the State of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State permit writers are joint NPDES/State permits issued under both State and Federal laws.

**pH**--The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

**Quantitation Level (QL)**-- A calculated value five times the MDL (method detection level).

**Responsible Corporate Officer**-- A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or have gross annual sales or expenditures exceeding \$25 million (in second quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures (40 CFR 122.22).

**Technology-based Effluent Limit**--A permit limit that is based on the ability of a treatment method to reduce the pollutant.

**Total Suspended Solids (TSS)**--Total suspended solids is the particulate material in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

**State Waters**--Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

**Stormwater**--That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

**Upset**--An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

**Water Quality-based Effluent Limit**--A limit on the concentration of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into a receiving water.

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## **APPENDIX C--TECHNICAL CALCULATIONS**

Several of the Excel® spreadsheet tools used to evaluate a discharger's ability to meet Washington State water quality standards can be found on the Department's homepage at <http://www.ecy.wa.gov/programs/wq/wastewater/index.html>.

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**APPENDIX D—RESPONSE TO COMMENTS**

**APPENDIX E—MAP OF DISCHARGE LOCATIONS**

**APPENDIX F—SUMMARY OF NONCOMPLIANCE**

**APPENDIX G—DISCHARGE MONITORING DATA**

**APPENDIX H—WASTEWATER CHARACTERIZATION**

**APPENDIX I—COPPER MONITORING DATA**

**APPENDIX J—MIXING ZONE ANALYSIS**

**APPENDIX K—REASONABLE POTENTIAL TO EXCEED ANALYSIS**

**APPENDIX L—WET TESTING RESULTS**

**APPENDIX M—GROUND WATER CRITERIA EVALUATION**

**APPENDIX N—LANDFILL MONITORING RESULTS**

**APPENDIX O—PERFORMANCE BASED REDUCTION OF MONITORING  
FREQUENCIES**